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HISTORY of ENDEMIC HAWAIIAN BIRDS

Part I. POPULATION HISTORIES--SPECIES ACCOUNTS
Freshwater Birds: Koloa-maoli

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ABSTRACT

Anas wyvilliana is a medium-sized (20" long) duck with variable mallard-like plumage. It was first described by P. L. Sclater in 1878. A total of 69 specimens are known world-wide in some 13 widely-scattered museums. Exhaustive search of literature, unpublished journals, and government reports uncovered some 3,006 observational notes, collection records, and related statements on relative abundance and geographical distribution from 1778 to 1982. Data are serially numbered, arranged in geographical and chronological order, referenced and systematically reviewed. Observers before 1900 recorded the Koloa as common and widespread, though becoming scarcer, in freshwater habitats on all of the major Islands. After 1903 there is a near-absolute 30-year gap of information on population status. Repeated surveys beginning in the 1940's have recorded successive population declines on Kaua'i, transient numbers on Ni'ihau, disappearance on O'ahu and Hawai'i, and extinction on Moloka'i and Maui. Release of some 853 captive-raised Koloa on O'ahu and Hawai'i from 1958 to 1980 has failed to establish clearly obvious self-sustaining wild flocks. It is concluded that relict numbers of this species on Kaua'i will continue to decline long-term and that restoration efforts, as presently known, will fail to effect re-establishment of self-supporting wild populations, except perhaps in token numbers.

1. Anas wyvilliana
 Koloa-maoli or Hawaiian Duck

Anas wyvilliana is a medium-sized (20 inches long) duck with variable mallard-like plumage. Male Koloa-maoli resemble male mallards in eclipse plumage but have a dark chestnut breast. Dusky green heads on male Koloa rarely appear on other than first-year birds. Female Koloa-maoli are similar to female mallards but are ruddier and with green rather than blue speculums (Peterson 1961). Koloa-maoli, termed simply Koloa hereinafter, differ chiefly from their nearest relative, the Laysan duck (Anas laysanensis), by their larger size, less regularly barred retrices, less reddish color, and lack of white around the eye (Rotschild 1893). Formerly common and widespread on all of the large Hawaiian Islands, natural self-sustaining wild populations are now apparent only on Kaua'i.

The first specimens of record were taken in 1840 on Kaua'i (Wailua River) by members of the U.S. Exploring Expedition (Wilkes 1845) followed a few years later by those collected in 1846 on O'ahu by Prof. Behn during the visit of the Danish corvette Galathea to the Hawaiian Islands (769, 1835). The species was first described by P.L. Sclater in 1878 from examples collected on the 1875 stop-over of the Challenger Expedition at Hilo, Hawai'i. Distribution of some 47 of 69 known specimens among some 13 repositories is as follows: American Museum of Natural History (24), Cambridge University Museum of Zoology (12), and National Museum of Natural History (11) (Banko 1979 report).

Wilson and Evans (1893), Rotschild (1900), Henshaw (1902), and Perkins (1903) include the Koloa in their early monographic treatments of Hawaiian birds. Schwartz and Schwartz (1949) furnish information on the status and distribution of this species a half-century later. Berger (1972) combined information from these and other sources in a contemporary summary account. The largest store of recent information on the relative abundance of the Koloa is that combined in unpublished reports of the Hawaii Division of Forestry and Wildlife (formerly Hawaii Division of Fish and Game) and U.S. Fish and Wildlife Service.

OBSERVATIONS, REPORTS AND SPECIMEN RECORDS

Introduction

Drawing conclusions from a large volume of historical information on relative abundance and distribution of Koloa required that data be geographically arranged and chronologically ordered in a systematic fashion, as outlined in the Introduction to Part I (CPSU/UH Avian History Report 4).. Records presented in the Appendix satisfy criteria necessary for basic documentation and comparative analysis.

In the following descriptive account, sources of published information are cited by author and year in the usual style. One, two or three digit numbers in parenthesis refer to specific records in the Appendix. Sources of published and unpublished information listed in the Appendix may be traced to complete references in the bibliography.

Historical Status and Distribution in the Archipelago

As indicated in the Appendix (No.'s 1-27), there are some 29 records related to the general status and distribution of Koloa in the Islands from 1879 to 1982. Most authors before 1915 point out the common status and broad distribution of this species in fresh water habitats of the major islands of the Group. More recent records are comprised largely of periodic counts by the Hawaii State Division of Fish and Game and U.S. Fish and Wildlife Service. The writer wishes to thank R.J. Shallenberger (USFWS) and M.Morin (HDFG) for supplying information and commentary helpful in interpretation of agency records.

Dole (1879) seems to have been the first European to specifically mention the distribution of the Koloa, stating that this species frequented the fresh water of the "whole group" of Islands (1). Besides specimens collected on Kaua'i in 1840, on O'ahu in 1846 and on Hawai'i in 1875, as previously mentioned, S.B. Wilson obtained an example from an unspecified island in 1888 (2) (Banko 1979 report). H.C. Palmer collected a "large series" of specimens on Kaua'i, Ni'ihau, O'ahu, and Hawai'i from 1891 to 1893 (Rotschild 1900) (3). Perkins (1903) was more explicit, saying that he "noticed it plentifully...in some localities becoming much scarcer than formerly and in others has practically disappeared...in many localities on Kauai, Oahu, Molokai, Maui and Hawaii...equally at home on the hottest coasts where suitable ponds are found, or in the mountains where I have noticed it as high as 7,000 feet..." (4). Munro (1944), referring to the 1890's, called it "a common bird...in coastal lagoons, marshes and mountain streams on all islands except Lanai and Kahoolawe" (5). Black (1901) stated that the Koloa was "getting scarcer every year in all parts of the group" (6), a fact that Henshaw (1903) repeated a few years later,

saying that it was "becoming scarcer and scarcer every year" (7). A decade or so later Bryan (1915) noted "of recent years they have become very rare except on the island of Kauai" (8). A total of about 30 specimens were collected by some seven collectors during the period of increasing scarcity, 1891 to 1946 (9).

Schwartz and Schwartz (1949) conducted an official Statewide survey of game birds from February 1946 to July 1947, reporting finding Koloa only on Kaua'i, Ni'ihau and O'ahu (9a). Hawaii State Division of Fish and Game began censusing waterbirds including Koloa on certain islands in 1963, and Statewide, with some gaps, in 1970. The resultant census data are shown in Table 1. It should be recognized at the outset, however, that agency census figures in Table 1 do not include Koloa in the many unsurveyed habitats. Even today, the majority of the population, hopelessly scattered in countless inconspicuous and inaccessible habitats on the island of Kaua'i, are overlooked on the semi-annual waterbird surveys. Suffice to say that counts in the early years, especially, were woefully short of the actual numbers which might have been reported as a result of a thorough survey. Before attempting to interpret the data in Table 1, the reader should be made aware of complex interrelated variables which are inherent in censusing and interpretation of results. Some of the factors which influence census results and obstruct the proper analysis of data are mentioned with their associated Appendix No.'s in the following records: long term population (62), season of year (37a,48), time of day (48), seasonal precipitation (57,61), propagation and release programs (19,23), demographic factors (49,61), coverage and sample size (20,51,53,59), environmental and habitat variables (18,37a,47,51), behavior patterns (37a,48,51,56), census focus and methodology (18), and interpretation of results (20,22,28-30,37a,41,47,51). Other factors could be added. It seems clearly evident, therefore, that the population data in Table 1 do not represent any calculable segment or proportion of the total population. It seems pointless to attempt to draw conclusions from the data presented in Table 1.

Anonymous (1982), presumably quoting quasi-official estimates by HDFG and/or USFWS, notes "modest population increases during the last decade...to around 1,000....improvement...a direct result of protection and wetland enhancement...releases have been made into the wild...(species) fairly secure...any reduction of management activities by state or federal government would be disastrous...recovery plants being drafted...". No background was provided for the population estimate of "around 1,000", or speculation that it represented an increase resulting from protection or wetland enhancement.

Island of Kaua'i

Islandwide Status and Distribution

One of Captain Cook's naturalists, William Anderson, is credited with being the first European to glimpse what no doubt were Koloa while ashore 20-22 January 1778 at Waimea (Stresemann 1950) (1171). Some 14 years later on 11 March 1792, the Log of the Chatham reported that while the ship lay at anchor in Wymoa (Waimea) Bay "gentlemen on shore were very successful in shooting, there being seldom a day that they did not kill half a dozen brace of ducks" (Bell 1929) (1172). Though Koloa were not specifically known to science at the time they were presumably at least included in the bag. The first specimens were not taken until nearly a half-century later in 1840 by members of the U.S. Exploring Expedition who secured them along the Wailua River, as mentioned previously (Wilkes 1845) (769).

Several reports around the advent of the 20th century reinforce the impression that Koloa were common and widely distributed on Kauai during the early days.

H.C. Palmer collected 6 specimens from 28 January to 13 March 1891 but failed to record the locality (Banko 1979 report) (69). The name of R.C.L. Perkins is on the label of a specimen collected 4 May 1895 at Mānā (538). Bryan (1901) reported seeing "several flocks" in the low swamps while collecting at V. Knudsen's place near Waimea (?Mānā) on 4 May 1900. A. Seale noted 14, took 3 specimens and saw 3 more later along the turbulent mountain stream "Wailie" (?Waialae) (Bryan 1915) (70). Miller (field journal) recorded (2 April 1903) having unsuccessful hunts two mornings and evenings "in the marsh and pond at the rear of the mill" (?Līhue) (71).

The importance of the Mānā swamp to Koloa is fortunately preserved in the memory of a Mr. Woodhouse of the Kekaha Sugar Co. who recalled that prior to drainage in 1923 this extensive area supported "about 400 ducks per square mile" (Schwartz and Schwartz 1953). The Schwartzes calculated that "approximately 2,400" Koloa may have resided in this 6 square mile tract before development into sugarcane land (539). Swedberg (1969) also credited residents of the area with reporting that Koloa existed in the Mānā swamp by the "thousands" before drainage (540). By the time of their 1946-1947 survey, Schwartz and Schwartz (1953) estimated, apparently from Koloa seen in drain ditches and remaining wetlands, that numbers had fallen to 5 per square mile, or a total of 30 for the Mānā area (541).

The status of Koloa on Kaua'i seems to have gone unnoticed from 1923 until the game bird survey by Schwartz and Schwartz in 1946-1947 when periodic fact-finding began.

In 1946-1947 Schwartz and Schwartz (1953) reported seeing 2 or 3 Koloa occasionally on 2-10 acre reservoirs, counted 8 on Waita (Koloa) "the largest number seen on any reservoir", mentioned being told by E. Knudsen that Kōke'e and Waialae were two "favorite" spots for collecting ducks, and that Koloa were not reported to occur in the Alaka'i Swamp (73,90,91,1526). Schwartz and Schwartz (1953) observed that this duck occurred "very sparsely" in 1946-1947 below 500 ft. elevation in the reservoirs, major irrigation ditches, the very few remaining marshy areas, the coastal portions of some of the larger streams, and some flooded rice fields, though they did observe 1 or 2 per lineal mile along some of the permanently-fed large irrigation ditches which flow through the sugar cane fields or connect one field with another (72,74). In conclusion, Schwartz and Schwartz (1953) estimated from sample counts and information from resident hunters, plantations workers and other observers, that some 500 Koloa remained islandwide (28). Along streams they found densities of up to 4 birds per mile on the major mountain streams from 500-4,000 ft. elevation where they estimated "probably more than a half" of the remaining 500 Koloa lived (29,30).

Except for the advent of HDFG censuses which will we treated next, there seem to be only 5 records of Koloa occurrence in the 1950's. Swedberg (1967) reported 3 juveniles seen at the unspecified location on 8 December 1954, 10 eggs were found 7 December 1955 in a Kālepa Ridge pasture, 2 downy young were observed 3 April 1956, and two juveniles were seen 23 December 1957 (both 1956 and 1957 sightings were in unmentioned locations), and a downy young was seen in 21 January 1958 in the Poipū area (75,76,77,770,1484). A few years afterwards, on an islandwide survey from June to August 1960, Richardson and Bowles (1964) reported that Koloa were resident "in small numbers" along streams or on reservoirs near the coast, but especially along the least-frequented streams to ca. 4,000 ft. elevation into the mountains (33).

The first mention of Koloa in relation to the HDFG annual islandwide waterfowl count seems to have been in 1958 when they were noted to be "conspicuous by their absence" during the 14-17 January count period (31). The 1958 observation, and results of censuses during the years which followed, are listed in Table 2.

Examination of data in Table 2, particularly with the background remarks in the Appendix, reveals variable factors influencing census results, and overall lack of knowledge of what the collected information represents. The count results shown in Table 2 will not, therefore, be further evaluated.

In addition to the periodic annual or semi-annual censuses, several population surveys of Koloa have been conducted in the past 30 years. Schwartz and Schwartz (1953), carrying out Statewide game bird surveys in 1946 and 1947,

found densities of up to 4 birds per mile on the major mountain streams from 500 to 4,000 ft. elevation. From their own sample counts, plus information obtained from resident hunters, plantation workers, and other observers, they conclude that Koloa on these streams constituted "probably more than half" of the estimated remaining population of 500 (28-30). Schwartz and Schwartz (1953), as a result of seeing 2 or 3 Koloa occasionally on 2 to 10 acre reservoirs, and 1 to 2 per lineal mile along some of the permanently-fed large irrigation ditches in sugar cane fields (72,73), stated that Koloa occurred "very sparsely" in lowland reservoirs (less than 500 ft. elevation), major irrigation ditches, the very few remaining marshy areas, the coastal portions of some of the larger streams, and some flooded rice fields (74). Swedberg (1967), from some 563 censuses of 12 habitats from 1962 to 1966, estimated 55 Koloa permanent and intermittent streams and ditches, projected 2,887 present in upland areas (41).. Calculating from a comparable data base several years later, from 1970 to 1971, HDFG reported that the average number of Koloa using selected habitats was less than one half of that estimated by Swedberg in 1967 (47), but that even the expanded sample size may have been too small to adequately measure population size (51). Shallenberger (1977), after an extensive and intensive wetlands survey from 12 May to 15 September 1977 during a severe drought, estimated that the islandwide population totaled 3,000 (63). Anonymous (1982), in a report printed by the Wildlife Management Institute, stated that Koloa had experienced "modest population increases during the last decade...to around 1,000" attributing improvement as the "direct result of protection and wetland enhancement...(and) releases into the wild", and indicated that the species was "fairly secure" (27). From the foregoing reports it is concluded that census efforts have not yet provided a data base from which reliable population estimates may be projected. The fact that individual Koloa are difficult to mark permanently for monitoring movements, and produce young more or less year-round, further complicates reliable calculation of the total population (88,89).

Appendix record numbers 69-119 (a listing of Koloa observed in multiple or unspecified locations) provide insight into relative abundance and distribution of this species unrelated to total population size. The sparse, broadly scattered nature of the population is emphasized in the many observations recorded by Richardson and Bowles (1964), Swedberg (1967), and a few others in the 1960's (75-89). Koloa observed in various districts of Kaua'i are documented in supplementary surveys by HDFG, Hawaii Audubon Society members, and others (92-119).

Relative Abundance of Koloa in 10 Quadrangles and 161 Habitats, 1956 to 1982

Results of some 26 years of recording Koloa in Kaua'i are summarized by quadrangle in Table 3, and by habitat in Table 4. Of a grand total of 2,543 Koloa counted in 1,585 censuses, some 2,183 (86 percent) were found in only 3 quadrangles, the average number per count reported in each quadrangle being 6 (HANAIEI), 3 (Lihue), and 1 (KOLOA). Some 67 (42 percent) of the 161 habitats surveyed are located within these three quadrangles.

A total of only 360 Koloa (14 percent) was found in the remaining 7 quadrangles, the average number reported per count in each of these notably less populated districts being only 1 in KEKAHA and WAIMEA CANYON, and fewer than 1 in HANAPEPE, KAPAA, ANAHOLA, HAENA, and MAKAHA POINT quadrangles.

A major share of the total census effort was expended by HDFG in counting Koloa in sparsely or non-populated habitats. For example, some 718 counts (45 percent) of total census effort resulted in an aggregate tally of only 360 Koloa (14 percent) of the total number seen.

With reference to Table 4, a total of 109 habitats (68 percent) received little or no use (averaging 0 percent count), 41 wetlands (25 percent) accomodated more than 0 but fewer than 5 per count, while only 11 areas (7 percent) were found with an average of 5 or more Koloa observed per census. Of 42 habitats of which Koloa have been censused for more than one year, some 29 (69 percent) revealed declining use, 9 (21 percent) received increasing use, while only 4 (10 percent) showed no change. Perhaps of even more significance is the fact that numbers of Koloa seen on 7 of 9 (78 percent) of the more heavily patronized habitats (averaging 5 or more Koloa per count) declined over the various periods of time represented.

In addition to the above findings, average counts of Koloa seen in some 22 habitats (Hanalei Taro; Hanalei Valley; Wilcox Ponds; Kekaha Pasture; Mānā Area; Wailua-Opaekaa; Wailua Homestead; Wailua Jail Swamp; Hanapepe Salt Pond; Kaumakani Gulch; Grove Farm Trash Pile; Kipu Reservoirs (combined), Kipu Reservoirs 1,2,3 and 4; Poipū Area; Waita Reservoir; Ahukini Reservoir; Aweoweonui Valley; Menehune Fish Pond; Lihue Plantation Settling Basin) were calculated in special studies generally earlier than the 1975-1982 count series forming the majority of data base. While the averages calculated in the special studies are not directly comparable with later results, it appears that of 14 habitats showing decided trends, Koloa use on 13 declined and increased on only 1. From examination of all the information in Table 4, faulty though it may be statistically, it is hard to escape the general conclusion that the Koloa population on Kaua'i declined significantly from 1956 to 1982.

Reproduction

The seasonal and geographical distribution of nesting seems to have gone largely unrecorded in Hawai'i except for the field investigation in the mid 1969's by Swedberg (1967). Swedberg (1967) logged sightings or reports of some 66 young every month of the year except August, mostly from 1962-1966, in natural to disturbed or man-made habitats from sea-level to 3,500 ft. elevation in all districts of the island (88). Swedberg's 1967 report, incorporating previous records compiled by R.E. Fuller (HDFG), and Schallenberger (1977) mentioning later sightings and reports of HDFG personnel (including downy young seen in August), provide almost all the information on seasonal and geographical distribution of Koloa reproduction anywhere in the Islands. Site specific observations of nests and/or young compiled from the Appendix are listed in Table 5.

Of the 56 records listed in Table 5, some 51 appear to be on different broods. Forty-one (80 percent) of the 51 non-replicative records were noted during the December to May period, indicating Koloa to be primarily a winter-spring breeder. Much more information on breeding season and habitat would have been available if observers since the 1960's would have kept separate account of nests, pre-flight young, and adults seen.

Island of Ni'ihau

Islandwide Status and Distribution

Rothschild (1900) was the first to report the presence of Koloa on Ni'ihau, stating that "Palmer observed large flocks, sometimes probably not less than a hundred together", there in July 1893 (1754). This record is substantiated by the collection of 10 specimens by Palmer on 27 July 1893 (Banko 1979 report) (1755). Koloa seem to have gone unreported on Ni'ihau from 1894 to 1938. Munro (1940) noted that he saw "a few" on eight of nine lagoons on 2 November 1939 (1736). Schwartz and Schwartz (1953), although apparently not visiting Ni'ihau themselves, noted that "Robinson reported occasional occurrence" of this species during the period of their study in the mid 1940's (1756).

After listing the Koloa on Ni'ihau as "thought to be extinct or extirpated" in 1969, HDFG began in 1970 to record numbers seen during periodic counts of other water birds (1737). Results of HDFG aerial censuses from 1970 to 1981 are presented in Table 6. Counts from Ni'ihau contain an element of unreliability due to aerial survey methods used.

As indicated in Table 6, numbers of Koloa censused islandwide have fluctuated overall from a minimum of 0 counted in January 1979 to 1981, to a minimum of 56 tallied in

July/August 1975 (1741, 1749-1753). The rather large number of 45 was counted during the January 1978 census, followed by either 3 or 1 seen in the July or August tally (1747, 1748, 1748a).

Occurrence of Koloea in Various Habitats

Distribution of Koloea among the dozen or so habitats on Ni'ihau, dependent upon availability of surface water, are shown in Table 7 in those years for which data are available.

Spotty, unreliable and missing census data, in addition to unrecorded water conditions, present obstacles to drawing of several conclusions from information presented in Table 7. Nevertheless, it appears that when sufficient water is available Koloea tend to be found most in Haao and Pōhueloa Reservoirs and Puuwai Pond(s) where an average of 5-7 individuals have been counted collectively on all three areas a total of 8 times. Halāli'i Lake and Ditches (ave. 3 Koloea per count), and Kaunini and Ke'enauhi Reservoirs (ave. 2 per count) may be favored to a lesser degree according to a collective total of 15 counts. Koloea appear to make little or no use of Halulu Lake and Ditches, Ka'ali'alinui Valley, Kaumuhonu Reservoir, Kiekie Pond(s), Nonopapa Lake, Palikoe Pond, or Pu'u 'Alalā Pond(s).

There seems to be no evidence that Koloea nest on Ni'ihau, though nests or downy young would not be readily apparent to observers from aerial surveys.

Island of O'ahu

Islandwide Status and Distribution

The first possible reference to Koloea on the island of O'ahu seems to have been a 1792 entry in the Log of the Chatham written on 8 March while the ship lay at anchor of Waikiki, stating that an "abundance of excellent shooting" was found ashore - "ducks...being found in great abundance" (Bell 1929) (2600). More than 30 years later on 10 May 1825, Bloxam (1825) reported that Waikiki was the "resort of (several hundred) wild ducks" and, on 13 May, logged observation of wild ducks on Ford Island, Pearl Harbor (2601). Prof. Behn collected 2 specimens on 22 October 1846 at unspecified place(s) on O'ahu during the visit of the Danish corvette Galathea to the Hawaiian Islands (1835).

Finsch (1880) reported "flocks" of ducks, most certainly Koloea, in Waimanalo marsh during his visit to that area in June and July 1879 (2626).

The first mention of population decline seems to be a report in Thrum's Annual for 1881 that although Koloa were "becoming scarce....(their) haunts...daily becoming more and more circumscribed by the progressive absorption of our marshes and taro-lands for the purpose of rice culture (and)...being driven away by the presence of laborers in the fields, and the incessant discharges of fire-arms for the purpose of scaring away granivorous birds from the rice...especially is this so of Waikiki, Manoa, Kalihi and Ewa, near town...where the sportsman may now look in vain for a brace where a few years ago he might have found them by the dozen" (1810, 1841).

Wilson (1893) collected a specimen at Waialua in the Ko'olau Mountains, and another in the Helemano area in 1888 (Banko 1979 report) (1836, 1837). Munro (1944) recalled, from a note made on 17 December 1890, that he saw two ducks, believed at the time to be Koloa, on the flooded floor of Punchbowl Crater within what is now the city of Honolulu (2585). H. C. Palmer wrote on 16 March 1893 that he took a specimen near a camp on the outskirts of the forest in a deep/ravine above Kahuku Ranch (Rotschild 1900) (1980). Palmer also took 5 specimens at undesignated areas on O'ahu from april to June 1893 (1838). Perkins (field journal) stated that Koloa were "common", and that "large bags" were taken in the Waialua area during the winter of 1892-1893 (1943). A few years later, about 1900, a bag of 19 Koloa were taken on a pond in Diamond Head Crater (Couzens 1919) (2556). It was during this period that Seale (1900) reported the Koloa to be "fairly common" among the tule swamps and ponds near the coast (1811). Bryan (1905) wrote of his 21 January - 9 March 1901 collecting trip into the Wai'anae Range that a pair of Koloa were seen mornings and evenings on a little stream near the cabin in Pukaloa Valley (?Makaleha Stream) at the lower edge of the forest within a few hours climb of the summit of Mt. Kaala (4,130 ft. el.) (1906).

Bryan's turn-of-the-century record is followed by a 33 year gap in information on the status and distribution of Koloa on the island of O'ahu. In 1935, Northwood (field journal) found 2 Koloa nests with eggs on the offshore islets of Mokulua on 16 June (2412), while a short time later, Munro (1946) reported "several nests seen and as many as 6 birds at a time were flying around" at the same location during observations conducted from 1935 to 1937 (2413). In 1939 Northwood reported that 2 pairs with 2 ducklings were seen in Waimānālo Marsh on 30 december (2627).

In 1940, Northwood (field journal) stated that eggs of this species were taken ca. 1 March on the Mokulua Islets, while on 27 October that year a pair was seen on Kaelupulu Pond (2258, 2414). According to Munro (1944), Woodside saw 5 nests that contained 8 to 10 eggs on one of the Mokulua Islets on 9 March 1941 (2415), evidently the source of a previous note that Koloa nested on the "steep grassy side of Mokulua"

(Munro 1941) (2416). It was apparently during this period that Munro (1944) mentioned that Koloa which nested on Mokulua returned to the main island "carrying or swimming the chicks to the Kawainui swamp" or to the outlet of Ka'elepulu Pond; that "Fleming" saw a duck fly to the swamp (?Kawainui) carrying a young between its feet; that "Alona" saw a duck alight and 3 ducklings swim out from it, and a few days later had 7 young ones (locations and dates not mentioned); and that "some boys" caught 14 (2 broods) on the beach near the outlet of Ka'elepulu Pond (1839, 1840, 2280, 2417).

From their 1946 to 1947 survey, Schwartz (1953) estimated that fewer than 30 Koloa remained on the island of O'ahu, and cited J.D. Smith's professional (HDFG) opinion that this species was still declining, though occasionally observed and still nesting (1812, 2418, 2419). Schwartz and Schwartz (1953) stated that Koloa were occasionally observed at Kawainui Swamp during their 1946-1947 period of study but Kleen (1947) was not successful in his search for them there (2327, 2328). However Donaghho (1947) reported seeing a duck, possibly a Koloa, on Ka'elepulu Pond on 4 January 1947 (2259), while Kleen (1947) reported seeing a duck with 6 ducklings, no doubt Koloa, on a small stream near Bellows Air Force Field on 9 February 1947 (2602).

As might be expected in a declining population, there were fewer reports of Koloa in the 1950's than in the 1940's despite significantly greater census coverage and frequency by members of the Hawaii Audubon Society. Anonymous (1953) watched a family for about an hour on the bank of an unidentified slough on 2 December 1952 (2281). Hatch (1953) reported that none were seen on Molukua Islets on a 3 May 1953 visit (2420), Eastman and Eastman (1958) left unverified records of seen on Salt Lake and another on Ka'elepulu Pond during their 23 March to 14 April 1958 tour through the Islands (2261, 2586).

Hawaii State Division of Fish and Game biologists began including Koloa on their censuses of water birds on O'ahu in the mid-1960's, recording none in 1964 and 1965, but finding 1 during their January 1966 count at Bellows Air Force Base (1815, 2603).

In 1968, HDFG listed 12 released on 13 May in Kapi'olani park by the Honolulu Zoo (2562). U.S. Fish and Wildlife Service noted 4 inbanded individuals observed in Kawainui Swamp on 21 December 1968, and speculated that these birds may have been "a portion of a residual population that has survived, or more likely the progeny from a small flock of semi-wild, free-flying banded Koloa maintained at Honolulu Zoo" (2329). Anonymous (1968) logged 3, apparently part of the free-flying Honolulu Zoo flock, during the 29 December 1968 Christmas Count (2557), while Anonymous (1969) reported 2, having apparently the same origin, seen the same date somewhere between Diamond Head and Paiko Lagoon (1842).

Hawaii Division of Fish and Game reported in 1969 that (wild) Koloa were thought to be extirpated on O'ahu (1816). Sightings of released birds or their progeny continued to be reported however. At Kawainui, Anonymous (1969) noted 2 seen about 2 January 1969 (2330). HDFG released 32 captive-raised Koloa at Kawainui on 17 January 1969. A note by USFWS concluded that the released birds were remaining in the area, 1 being found dead on the Kailua Intermediate School grounds a few weeks later (2332). Months later, Anonymous (1970) stated that 9 Koloa were counted at Kawainui on 28 December 1969 (2333). In the Kapi'olani Park area 6 of the free-flying flock maintained by the Honolulu Zoo were seen during the 28 December 1969 Christmas Count (Anon. 1970) (2563).

In 1970, a pair of Koloa were observed on Salt Lake on 8 March by Mull (1970). Nine from the free-flying Zoo population were reported seen in Kapi'olani Park on the 27 December Christmas Count, with 8 (6 observed regularly) at Diamond Head (Mull 1971) (2558, 2564). Only one report of Koloa seems to be on record for 1971 - a report from USFWS files that a female Koloa took up residence with domestic ducks at Kailua on 25 January 1971 (2281a).

In 1972 Mull (1972) stated that 3 Koloa were the most seen on Salt Lake at any one time "during the past 2 years" (2588). Hawaii State Department of Land and Natural Resources noted that this species occurred on O'ahu "in small numbers" that same year (1817). Hawaii Division of Fish and Game reported that on 11 April a Koloa with 8 ducklings was caught (and later raised for release by staff members) in the yard of a resident near Black Point (Kūpikipiki'ō), Diamond Head (2554). The 17 December 1972 Christmas Count produced a census of 2, probably originating from the free-flyng Honolulu Zoo flock at Kapi'olani Park (2566).

There seems to be only 2 records of Koloa in 1973 - an HDFG count of 2 on 8 August at Kawainui (2334), and 2 in the Hāmākua-Wigwam area on the same date (2404) - for a total islandwide tally of 4 (1818).

In 1974 HDFG reported releasing 24 Koloa at Kawainui on 3 March, 11 at Waimea Falls Park on 28 May, and 6 at Kawainui on 5 June, but later only 3 were counted islandwide in August (1 at Salt Lake and 2 at Kaneohe MCAS) (1819, 1820, 1890, 2286, 2296, 2296a, 2335).

On 10 November 1974 HDFG reported seeing a Koloa at Kaneohe MCAS near the release pen where on 15 November, from 19 to 21 captive-raised birds (including at least 4 from Pohakuloa), were released (2287, 2288, 2295, 2296b, 2336). Six of the released birds were seen 10 days later on 25 November on Nuupia Pond, Kaneohe MCAS (2296c).

In addition to the above observations, which pertain chiefly to those recorded by HDFG, results of some 15 sightings (mostly by members of the Hawaii Audubon Society) from 1968 to 1980 are a matter of record (1842-1856). These 15 counts, all in 2 or more areas, are supportive of HDFG counts during this period and will not be furthered considered here.

Occurrence of Koloa in Various Habitats, 1975-1982

Observations of Koloa, including those of captive-raised stock released in the wild, are presented by quadrangle and habitat in Table 8.

In summary, it is not certain that wild-bred Koloa were extinct on O'ahu when release of captive-raised stock was initiated by the Honolulu Zoo in May 1968. In 1946 to 1947, J.D. Smith (HDFG) estimated that about 30 Koloa survived islandwide, some still nesting, although the islandwide population was observed to be declining (Schwartz and Schwartz 1953) (1812, 2418, 2419). There seem to be only 5 observations of Koloa on O'ahu from 1948 through 1967, and the validity of some of these records could be argued. There is also a possibility that Koloa from Kaua'i may move to O'ahu on occasion, thus further confusing the status of any disparate native O'ahu population. Whatever the situation, it appears that few, if any, wild-bred O'ahu stock survived the final decline observed to be in progress in 1946 and/or 1947. It is thus reasonable to assume that Koloa censused from 1975 to 1982 (Table 8) represent either some of the 379 captive-raised Koloa released on O'ahu (Table 9) or their subsequent progeny.

Numbers of captive-raised Koloa released on O'ahu from 1968 to 1979 are shown in Table 9.

As shown in Table 9, a total of 450 captive-raised Koloa were released at some 5 locations on O'ahu during the 15 year period, 1968 to 1982. Except for the 12 raised by the Honolulu Zoo and the 11 disseminated by the San Antonio Zoo, all of the 427 birds released were produced by HDFG at the Pōhakuloa propagation facility on the island of Hawai'i. Records in the Appendix indicate that most if not all the captive-raised birds were birds-of-the-year which were banded and color-marked before being liberated. Marking was practiced to permit identification of individuals which might be sighted in habitats other than that of the release site.

Number of Koloa observed on O'ahu at locations other than where they were liberated are listed in Table 10.

As indicated in Tables 9 and 10, only 9 of some 450 liberated individuals were subsequently reported at locations other than where they were released. Review of sightings at release locations in the Appendix show that liberated stock tend to remain on or near the site where they were set free.

Indeed, most if not all, captive-raised stock are confined to the area in which they are to be released for a month or so before their liberation to encourage residency. The 9 individuals reported in areas other than where liberated therefore represent some exceptions. Most released birds thus seem to disappear in or near the habitat in which they have been set rather than in some distant locality. The principal goal of the Koloa release program is to encourage natural reproduction in the area of liberation. What little is known of breeding by such released stock and their subsequent progeny is shown in Table 11.

Close examination of some 20 observations of neasts or ducklings listed in Table 11, shows that 19 were noted at or near release sites, the sole exception being the report of a duck with 7 young seen on Kahana Stream on 21 May 1978. Some 20 observations apparently represent re-sightings of the same individuals, while others may be less obvious duplications. For example, it seems probable that the 2 broods reported in late January 1977 at Ka'elepulu-Hāmākua were possibly the same; the 5 broods seen from early March to late June of 1977 at Kāne'ohe MCAS Sewage Lagoon represented not more than 3 different families; the 3 groups observed at Waimea Falls from mid-April to late June 1977 were actually the same brood, etc. On the other hand, except for occasional visits to release sites it appears that no special attempt was made to locate nests or broods. The data in Table 11 are thus presumably biased to reflect evidence noted from casual or perfunctory surveys rather than comprehensive investigations.

Shallenberger (pers.comm.) clarifies the recent (1983) use of some areas by released stock, advising that both the James Campbell NWR, particularly the Ki'i Unit, and the adjacent Amoriant aquafarm, have become important Koloa habitats, perhaps the most important on O'ahu. U.S. Fish and Wildlife Service observers regularly see between 15 and 30 birds on surveys that cover the 2 habitats. A half-dozen nests, or young, have also been found between Ki'i and the aquafarm, and it seemed certain to him that several more went undetected due to the fact that these species occupies several ephemeral ponds that are only rarely visited during regular maintenance activities. Since no Koloa have been released at Kahuku, all of the colonists must have originated from releases made elsewhere. Shallenberger (pers. comm.) adds that Koloa now regularly seen at Pearl Harbor NWR must also have moved from quite a distance since none were liberated there.

Island of Moloka'i

Islandwide Status and Distribution

The only written account of Koloa and Moloka'i seems to be that of Perkins (field journal) who noted "up from Makakupaia" (camp) on 20 May 1893, logged a pair in or near

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The only written account of Koloa and Moloka'i seems to be that of Perkins (field journal) who noted "up from Makakupaia" (camp) on 20 May 1893, logged a pair in or near

the same area on 11 June, and stated that "generally one or more" were seen in the Pritchardia bog above the wooden shack at Makakupa'ia which was located "at the lowest edge of continuous forest " (2667-2669). Bryan (1908) noted "none seen" as a result of his two month-long (15 April-15 June) 1907 ornithological survey, adding that he doubted "very much" if any were then living on Moloka'i, although formerly they "reportedly were always seen frequenting high mountain pools at the Halawa and of the island" (2628,2634). Shwartz and Shwartz (1953) quoted J.D. Smith (HDFG) as saying that this species was "known to occur" historically on Moloka'i (2629). HDFG (1969 report) stated that thge Koloa was "thought to be extinct" on Moloka'i (2630). More recently, Shallenberger (1977 report) stated that "Pekelo indicated that the most recent report of this species was in the Kawela area" in the 1930's (2635).

Annual and semi-annual surveys of waterbirds conducted by HDFG on Moloka'i since 1957 have not produced any sightings of Koloa. A sampling of areas covered in these counts, together with negative results obtained, are listed in the Appendix (2631-2633, 2636-2666, 2670).

Island of Lāna'i

There seem to be no records of Koloa on the island of Lana'i during the historical period from 1778 to 1983. This is not surprising considering the complete lack of suitable habitat for this species.

Island of Maui

Perkins (field Journal) provides the only first-hand evidence that Koloa occurred on the island of Maui, recording on 28 March 1894 that he collected a specimen in the vicinity of "Mr. Payne's" (Paine's) mountain house "considerably higher up" on Haleakalā than Olinda (2694). Bonsey (1951), apparently a visitor touring the Islands, "estimated 18" were seen on Kanahā Pond sometime during a 7 July to 11 September bird-watching tour of Maui in 1951 (2681). Bonsey's report is no doubt a case of mistaken identity as no Koloa had been noted on Maui in over 50 years and the observation was made during the late summer months when migratory ducks are commonly present. Hawaii Division of Fish and Game (1969 report) listed the Koloa on Maui as "thought to be extinct" (2674). A USFWS record lists 2 Koloa observed 14 May 1970 on Kahana Pond but provides no details of identification (2682). Shallenberger (pers. comm.) mentions that there are a few recent records of Koloa on Kahanā Pond, and that State biologists believe such birds may be free-flying escapees from the Maui Zoo. There is apparently no contradictory evidence to dispute this possibility.

Annual and semi-annual waterbird surveys by HDFG since 1956 have not produced any sightings of Koloa on Maui. A

sampling of areas covered in these counts, together with negative results recorded, are listed in the Appendix (2675-2680, 2683-2693).

Island of Hawai'i

Early Records, 1841-1902

The first mention of Koloa on the island of Hawai'i seems to be that of Wilkes (1845) who wrote under date of 11 January 1841 that members of the Exploring Expedition observed a "quantity" of Koloa in shallow pools called the "duck ponds" at an open space in the woods on the slopes of Mauna Kea while on their way from Hilo to the summit (2962). Some 35 years later, during a brief stop-over by the Challenger Expedition, 2 examples of this species were collected during the Expedition's 14-19 August 1876 visit to Hilo (2964, 2965). While on the return leg of a round-trip visit from Hilo to Kilauea Volcano, one of the Expedition members, Campbell (1876), wrote that they "started many a wild duck...every hollow being under water" (2732).

Several other Koloa records pertain from the late 1880's through the turn of the century. Wilson (1893) wrote that he observed this duck at Hilo (in 1886/1887) (2966). Palmer collected 4 specimens in Kona somewhere between Ka'awaloa and Honomalino, during a period from 29 October to 12 November 1891 (Banko 1979 report) (2733). About nine months later, on 26 July 1892, Perkins (field journal) collected a Koloa above Ka'awaloa at about 3000 ft. elevation (Banko 1979 report) (2734, 2927). Henshaw (1902) collected a pair at Ka'alu'alu in October 1899, and later wrote that though "becoming comparatively scarce" in the Hilo area it was "by no means uncommon" in 1897 (Banko 1979 report) (2928, 2967, 2968). Of its general distribution on the Island, Henshaw (1902) wrote, "although by no means entirely absent from the coast...it loves to follow the windings of the little mountain streams" (2695).

A long-time resident of the Waipi'o Valley area, Mr. Matsunami, recalled that Koloa were abundant in the Valley ca. 1919 when rice growing was popular, but that this duck disappeared sometime after 1927 when the last rice was grown (Banko field notes) (2870, 2871). In 1941, J.H. Christ, Chief Ranger of Hawaii National Park, is credited by Baldwin (1941) as stating that Koloa might still be found near Wai'ohinu, south of the Park (2945). In their 1946/1947 statewide survey Schwartz and Schwartz (1953) found the Koloa, but "only rarely", on some of the reservoirs of the Island, but mentioned no localities (2735).

Apparently only a few Koloa existed on the island of Hawai'i in the early 1950's and perhaps then only in the Kohala Mountains. In a recollection that applied to the 1940's and 1950's, D. Sproat, an old-time ditch rider for the

Kohala Sugar Company, told me in 1968 that he used to see a few Koloa in the lower stream drainages in the windward Kohalas, but he had not seen any there, or anywhere, for many years (Banko, field notes) (2739). In 1969 HDEG (1969 report) listed the Koloa as "thought to be extinct or extirpated" from the island of Hawai'i (2703).

Hawaii Division of Fish and Game initiated periodic islandwide censuses of waterbirds including Koloa, on the island of Hawai'i in 1958, and have continued to carry them out annually or semi-annually nearly every year since. Numbers of Koloa seen from 1958 to 1981 are shown below in Table 12, and most likely represent captive-raised stock released in the wild or their resultant progeny. It should be realized, of course, that the numbers in Table 12 do not include Koloa which may frequent isolated habitats in the Kohala Mountains, rarely if ever visited by man. However, judging from the quantity and type of such habitats, the number of Koloa which might frequent them must, if any, be few indeed.

As indicated in Table 12, counts of Koloa have varied radically from year to year. The most likely reason for fluctuating numbers of Koloa censused was the intermittent liberation of captive-raised stock, as shown in Table 13.

As indicated by data in Table 13, some 474 Koloa (approximately equally divided by sex) were captive-raised and released on the island of Hawai'i over a period of 24 years from 1958 to 1980. That there were few, if any, Koloa on Hawai'i during the late 1950's was previously indicated.

Numbers of Koloa observed or censused in some 22b habitats on the island of Hawai'i from 1958 to 1981 are shown in Table 14. The Koloa reported represent captive-raised stock, or their descendants, released on the Big Island over a period of 24 years. The little that is known of their reproduction in the wild is shown separately later. The sample of negative findings reported in most habitats from 1976 to 1980 represents a still larger volume of negative observations, sometimes unrecorded, found in identical or similar habitats from 1958 to 1975. Records listed for Kahuā Ranch Ponds/Release Site, and resultant sightings on the Nearby Kahena Ponds/Ditch from 1958 to 1975, are closely linked as might be expected.

As shown in Table 14, captive-raised Koloa or their progeny go unrecorded during censuses of water birds on widely separated habitats located at a significant distance from the release site. However, a few show up at various locations not covered on periodic survey or on regularly visited waters on other than scheduled census days.

Shallenberger (1977 report) noted that Lum "frequently" observed color-marked individuals in Pololū Valley until about

1975, after which sightings ceased (2802). However, Paton (1981) stated that Giffin noted Koloa in Pololū Valley "regularly", but mentioned no dates (2803). Lack of specific details regarding numbers of this species seen and dates of observations downgrades the value of such second-hand reports in judging usefulness of Pololū Valley to Koloa.

Swedberg (1968) reported that 2 Koloa were observed on 30 October 1968 in a small pool of Wainoloa Stream approximately 400 yards above the Marine Dam, Kohala Watershed, and expressed the opinion that this was the "first sighting of wild Koloa on Hawaii in more than 20 years" (2814). Paton (1981) cites Giffin as his source for the report that Koloa are seen "regularly" in the Waimea area, but no details on numbers or dates seen are furnished (2852). Farther east along the southern flank of the Kohala Mountains, van Riper (1973) stated that a pair of Koloa could often be found feeding in the Hāmākua Ditch, but gave no specific locations or dates (2950). A HDFG report in 1974 noted that a duck with 5 ducklings was seen in Hamakua Ditch by a State employee in March (2851). In Waipi'o Valley, along the southeastern edge of the Kohala Mountains, Shallenberger (1977 report) stated that a land-owner who appeared quite familiar with water birds told him that he had observed a flock of 10 to 12 Koloa in the north pond 2 years previously (2876). This flock perhaps originated in 1974 from the 47 or 48 released at Kahuā ranch, some 12 miles to the northwest.

Liberated captive-raised Koloa and/or their progeny are also reported in habitats farther south on the island of Hawai'i. Records maintained by HDFG show that two of the individuals released in December 1968 returned to Pōhakuloa on the southern flank of Mauna Kea, 1 in January and 1 in February 1969 (2960, 2961). Other such individuals may have been noticed from time to time, but may have been unrecorded. A few miles to the east of Pōhakuloa, Paton (1981) observed 3 Koloa to land at 0900 hours and take off at 0915 hours in October 1980, on a small pond on the Pu'u Ō'ō Ranch, 4 km. north of mile marker 23 on the Saddle Road at 1800 m. elevation (2963). In the Hilo area, Shallenberger (1977 report) cites H. Baldwin as the source of a report that Koloa were released in Wailoa Pond prior to 1960, but all were killed directly or indirectly by the 23 May tsunami that year (2987).

There seems to be but a single report of a Koloa observed on the Kona Coast in historical times. Shallenberger (1977 report) states that he observed 1 on his first trip (9 June) to Ōpae'ula (Makalawena) Pond, but none of the second (8 July), "presumably...(1) released in recent years in the Kohala Mountains" (2894).

Liberation of captive-raised Koloa on Hawai'i over a period of many years has resulted in the eventual pairing and breeding by a small proportion of the liberated stock or their

progeny. Breeding success, as determined from observations of ducklings or immatures, is summarized in Table 15.

Despite the lack of specific details necessary for drawing trustworthy conclusions from data in Table 15, a minimum of 10 broods were observed to result from release of 474 Koloa on the island of Hawai'i from 1958 to 1981. Of course, the number of broods produced during unobserved periods and in unvisited locations may have far exceeded those reported. Most offspring were, however, seen within 6 miles of their Kahuā Ranch release site, indicating only minimum dispersion of surviving stock. The rate of reproduction also appears to be minimum and temporary rather than that which might be expected from optimum survival and breeding of transplanted stock.

Whatever the foregoing evidence suggests, HDFG reports project a positive image of the raise-for-release Koloa restoration program. Conclusions from a 20 April to 18 October 1975 evaluation states, "...survival, based on observations of unmarked birds, appears to have been good...natural reproduction was observed during each year from 1971 through 1974...dispersal has been restrictive...formal sanctuaries not imperative at this time, since range is relatively secure ...an alternate release site in Waipio Valley should be developed to accelerate dispersal to other suitable habitats...all data were evaluated to provide information for the development of a management plan, including establishment of sanctuaries and alternative release sites" (2842). In a later (1977) report, HDFG stated that"...release of captive-raised stock has achieved a measure of success...Hunters reported broods of ducklings over a wide segment of the Kohala area, particularly in the mauka reservoirs" (2740). Information on localities and dates of observations by hunters to substantiate these reports was not furnished in the 1970 HDFG report, however, leaving the degree of success in doubt.

GEOGRAPHICAL DISTRIBUTION OF RECORDS

Of the more than 3,000 records pertaining to the status of Koloa in the Islands, relatively few (28) apply to the population as a whole. Roughly 10 are statements of relative abundance and collection records made before or shortly after the turn of the century, while some 18 represent periodic statewide censuses, including results of captive-release restoration programs logged from the 1960's through the initial 1980's.

The following interpretation of geographical distribution of Koloa applies to data collected after large-scale disappearance of this species in the early part of this century.

As might be expressed from a population largely self-supporting on only one island since the early 1900's, some 1,707 of the more than 3,000 records were logged since the 1950's on Kaua'i. Since the listed census information includes absence as well as presence of Koloa in unsuitable marginal habitat, most of the actual data are negative. The following areas are, however, comparatively well utilized: Hanalei (including Hanalei National Wildlife Refuge), Mānā Pond/Marsh Complex, Ōpaeka'a Stream bottom, Kīpū Reservoirs (mostly No.'s 3 and 4), and Hulē'ia National Wildlife Refuge. In addition, it should be pointed out that the majority of Koloa on Kaua'i spend most of their time along hundreds of miles of small streams, ditches, and inconspicuous wetlands (some temporary), which are not covered in current census efforts.

On Ni'ihau, when water conditions are favorable, a few Koloa may be found listed in decreasing order of abundance on one or more of the following habitats: Pōhueloa Reservoir, Pu'uwai Pond(s), Hā'ao Reservoir, Hulali'i Lake and ditches, Kaunui and Keanauhi Reservoirs.

An estimated 30 Koloa, the last stock of wild ancestry on O'ahu, utilized the Kawainui-Ka'elepulu-Bellows Air Force Base complex of wetlands from the mid-1940's up until the early 1950's. The last brood from such stock was noted on an unidentified slough, apparently in this area, on 2 December 1952.

Some 450 captive-raised Koloa have been released on O'ahu from 1968 to 1982. Numerous sightings of liberated stock have been recorded in or near the area of liberation particularly for a short time following release, e.g. Kāne'ohe MCAS, Kawainui, and Waimea Falls. Most of the aparent progeny of such captive-raised stock have also been noted in or near the area of release. A few released Koloa, or their subsequent progeny, have also been observed on rare occasions in more distant habitats. Recent evidence points to increased observations of Koloa in Pearl Harbor National Wildlife Refuge, and particularly at James Campbell NWR and Amorient aquafarm where both nests and progeny of released stock have been seen.

On Moloka'i there seems to be only two direct first-hand records of Koloa, both sightings in 1893 in a Pritchardia above a wooden shack at Makakupa'ia, then located at the lowest edge of continuous forest. Records of Koloa on Moloka'i are no doubt limited more by failure of early observers to document than to observe them. The most recent recollection of this species is a second-hand report that it was present in the Kawela area in the 1930's.

There seems to have been no observations of Koloa on Lāna'i during the historical period (1778 to 1983).

On Maui, there is apparently only one account of Koloa, that of a single specimen collected high up on Haleakala in 1894. All other reports apparently represent free-flying escapees from the Maui Zoo.

Koloa were widespread on the island of Hawai'i from 1841 to 1899, being specifically noted on Mauna Kea above Hilo, along the trail from Hilo to Kilauea, near Kaawaloa in Kona, and along the southern coast at Kaalualu. One resident recalled that this species was still abundant in Waipi'o Valley when rice growing was prevalent up until about 1927. Only a few scattered or generalized reports of their presence near Waiohinu, on unnamed reservoirs, and in the Kohala Mountains are in evidence during the 1940's and 1950's. By 1967 this species was thought to be extinct on the Big Island.

Some 474 captive-raised Koloa were released on Hawai'i from 1958 to 1980. As on O'ahu, numerous sightings of liberated stock have been recorded, particularly for a short time following release, mostly in or near the area of liberation, e.g., Kahuā Ranch and Kahena Pond(s)/Ditch. Most of the progeny of liberated Koloa have also been seen in or near the area in which they have been set free. On rare occasions a few released individuals or their subsequent offspring have also been noted in more distant habitats, however self-sustaining populations are not clearly in evidence on any island except Kaua'i where the long-term trend remains down.

SUMMARY AND CONCLUSIONS

The Koloa, or Hawaiian Duck (Anas wyvilliana), is a medium-sized duck with variable mallard-like plumage. The species was first described by Sclater (1878) from specimens collected on the 1875 visit of the Challenger Expedition to Hilo, Hawai'i. A total of 60 specimens in some 13 museums are known world-wide.

Naturalists before 1900 recorded the Koloa as common and widespread on 5 of 6 major Islands, occurring from sea-level fresh-water ponds and marshes, to small headwater streams high in the mountains. Population decline was noted as early as the 1890's. After 1903 there is a nearly absolute 30-year gap of information on the population status of this species.

An official Statewide game-bird survey in 1946 and 1947 recorded substantial numbers of Koloa on Kaua'i, transients only on Ni'ihau, only about 30 on O'ahu, and presence of this species only rarely on reservoirs on Hawai'i. Though reliable year-to-year census data of the self-sustaining wild population on Kaua'i are not available, the long-term trend suggested by habitat monitoring indicates that numbers of this species continued to dwindle through the 1970's.

In an effort to restore self-sustaining wild populations, 474 captive-raised Koloa were released on Hawai'i from 1958 to 1980, while 450 were liberated on O'ahu from 1968 to 1979.

Captive-raised stock and a few resultant broods were subsequently sighted, mostly near release sites, within a year or so after liberation. Though establishment of National Wildlife Refuges and subsequent development of habitat in recent years has appeared to have some positive effects there is little evidence suggesting that independent wild populations have yet been established. It is therefore concluded that, based on the historical evidence, wild Koloa on Kaua'i will continue long-term depopulation while liberated captive-raised stock and subsequent offspring will continue to disappear in the wild until such time as restoration measures become effective.

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Examination of population data listed in the Appendix shows few statements of relative abundance by observers before and shortly after the turn of the century. After a pronounced drop in observations from the 1910's through the 1930's, records of relative abundance increased in the 1940's, declined slightly in the 1950's and then with the large number of negative reports, literally exploded during the 1960's, 1970's, and 1980's. Information on Koloa numbers in the 1940's and 1950's was logged primarily by members of the Hawaii Audubon Society and personnel of the Hawaii State Division of Fish and Game, while that from the 1960's until the early 1980's was supplied by HDFG and USFWS.

The chronological distribution of Koloa observation records by decade including both positive and negative findings, is shown in Table 16.

Table 1.

Koloa Recorded Statewide by HDFG on Waterbird Surveys, 1963-1981.

Year	January	Islands*	July/August	Islands
1963	17 (all on Kauai)	Ka-Oa-Mo-Ma-H		
1964	70 ¹ (25 on Kauai)	Ka-Oa-Mo-Ma-Ha		
1965	21 (all on Kauai,	other islands unrecorded)		
1966	3 (2 on Kāuāi)	Ka-Oa-Ma-Ha		
1967	26 (all on Kauai)	Ka-Oa-Mo-Ma-Ha		
1968	20 (all on Kauai)	Ka-Oa-Mo-Ma-Ha	6 (all on Kauai)	
1969	30 (all on Kauai)	Ka-Oa-Mo-Ma-Ha		
1970			29 (26 on Kauai)	Ka-Ni-Oa-Mo-Ma-Ha
1971-1974	unrecorded			
1975			64 (all on Kauai)	
1976	85 (all on Kauai)		78 (all on Kauai)	
1977	143 (all on Kauai... record number... severe drought)		54	
1978	54 (all on Kauai...sharp decrease attributed to severe drought in 1977)			
1979	51 (all on Kauai)		45 (all on Kauai)	
1980	49 (all on Kauai)		84 (28 on Kauai)	
1981	67 (33 on Kauai)			

*Legend: Ka=Kaua'i, Ni=Ni'ihau, Oa=O'ahu, Mo=Moloka'i, Ma=Maui,
Ha=Hawai'i.

¹includes unverified and unlikely report of 45 from island of
Hawai'i.

Table 2.

Koloa Recorded by HDFG on Kaua'i, 1958-1981

Year	January	JULY/AUGUST	Appendix No.
1958	(0)		31
1959	44		32
1960	12		34
1961	27		35
1962	15		36
1963	17		37
1964	25		38
1965	21		39
1966	2		40
1967	26		42
1968	20	6	43, 44
1969	30	no data	45
1970	no data	26	46
1971-1974	no data	no data	
1975	no data	64	50
1976	85	78	52, 54
1977	143	54	55, 58
1978	54	no data	60
1979	51	45	64, 65
1980	49	28	66, 67
1981	33		68

Table 3.

Summary of Koloa Censused by HDFG by Quadrangle,
1956-1982, Island of Kaua'i.

Quadrangle	Total No. Counted	Total No. Counts	Ave.No.* Per Count	Total No. Habitats
MAKAHA POINT	3	21	0	2
HAENA	(7)	17	0	2
HANAIEI	(1192)	197	6	18
ANAHOLA	41	119	0	15
KEKAHA	122	149	1	14
WAIMEA CANYON	6	4	1	2
KAPAA	69	251	0	26
HANAPEPE	112	306	0	33
KOLOA	449	359	1	35
LIHUE	542	162	3	14
	-----	-----	---	-----
Totals	2,543	1,585	2	161

* averages rounded to nearest whole number

() includes unobserved adults associated with downy young
or nest seen

Table 4.

Koloa Censused by HDFG in 10 Quadrangles, 161 Habitats,
Island of Kaua'i, 1956-1982

Quadrangle & Habitat	Serial No."s	Census Period	Total No. Counted	Total Counts	Ave.No. Counted	Ave.No. ¹ Counted	
						1stHalf Period	2ndHalf Period
MAKAHA POINT							
Kolo Reservoir	120-130	1975-1981	0	11	0		
Saki Mana Res.	131-140	1975-1980	3	10	0		
HAENA							
Haena Pond/Marsh	141-142	1968, 1977	1	3	0		
Wainiha Taro	152-164	1963-1980	(6)	14	0		
HANALETI							
Anini Taro	165	1964	(3)	1	3		
Hanalei Valley	166-176	1956-1977	(38)	13	3	4	2
Hanalei Taro	177-191	1963-1974	(39)	13	3	4	2
Hanalei P.O.Taro	192-201	1975-1980	8	10	1	0	1
Hanalei Trader Taro	202-210	1975-1980	7	9	1	1	0
Hanalei River	211-224	1964-1981	(18)	14	1	3	0
Hanalei NWR*	225-258	1977-1982	717 ²	32	22	29 ²	15
Hanalei NWR IS	259-268	1975-1980	100	10	10	12	8
Hanalei NWR AF/S	269-278	1975-1980	133	10	13	18	8
Kalihiwai River	279-292	1965-1981	(18)	14	1	3	0
Kalihiwai Res.	293-302	1975-1980	1	10	0		
Kalihiwai Bog	303	1977	1	1	1		
Kalihiwai PF	304	1978	0	1	0		
Lumahai River	305-320	1966-1980	(52)	17	3	3	3
Princeville G.C.	321-330	1975-1980	12	10	1	2	0
Waioli Taro	331-340	1975-1980	10	10	1	0	2
Waipa Taro	341-350	1975-1980	23	10	2	4	0
Wilcox Ponds	352-362	1975-1980	12	12	1	0	2
ANAHOLA							
Anahola Estuary	363-373	1975-1981	1	11	0		
Koloko Res.	374-384	1960-1980	3	11	0		
Koloko PF	385	1978	0	1	0		
Kamoku Pastures	386-395	1975-1980	4	10	0		
Kaneha Res.	396-404	1975-1980	2	9	0		
Kanehu Res. #1	405-413	1975-1980	0	9	0		
Kanehu Res. #2	414-423	1975-1981	3	10	0		
Kanehu Res. #3	424-433	1975-1981	4	10	0		
Kilauea Estuary	434-446	1964-1981	6	14	0		
Kilauea Town	447	1963	(2)	1	2		
Mimino Res.	448-450	1975-1978	0	3	0		
Morita Res.	451-460	1975-1980	5	10	1	1	0
Puu Ka Ele Res.	461-470	1975-1980	3	10	0		
Waiakalua Res.	471-479	1975-1979	5	9	1	1	0
Waipahee Stream	480	1966	(3)	1	3		

Table 4 (Cont'd)

Quadrangle & Habitat	Serial No.'s	Census Period	Total No. Counted	Total Counts	Ave.No. Counted	Ave.No. ¹	Ave.No. ¹
						Counted 1stHalf Period	Counted 2ndHalf Period
KEKAHA							
Kekaha	481	1963-1966	21	15	1		
Kekaha Pasture	482-493	1974-1980	21	11	2	2	2
Kekaha SB	494-504	1970-1980	7	11	1	1	0
Kekaha S/Res.	505-515	1970-1980	4	11	0		
Kahelunui Res.	516-526	1975-'81	0	11	0		
Mana Base Pond	527-537	1975-1980	5	11	0	1	0
Mana Marsh	546-550	1968-1980	39	10	4	4	1
Mana Brackish	556-571	1974-1980	21	16	1	2	1
Mana House R.	572-581	1975-1980	2	10	0		
Mana Res.	582-590	1976-1981	0	9	0		
Niu Valley Res.	591-599	1976-1980	2	9	0		
Waiawa Res.	600-609	1975-1980	0	10	0		
Wailau S Res.	610-615	1976-1980	0	6	0		
Waimea H. Res.	616-624	1975-1980	0	9	0		
WAIMEA CANYON							
Kepani res.	625	1981	0	1	0		
Koaie Cabin	626-628	1961-1966	6	3	2		
KAPAA							
Aii Res.	629-640	1975-1981	0	12	0		
De Mello Res.	641-651	1975-1981	0	11	0		
Fern Grotto	652-661	1975-1981	0	10	0		
Halaula Res.	662-669	1975-1980	0	8	0		
Hanahanapuni	670-679	1975-1981	0	10	0		
Hanamaulu Flats	680-681	1977	ca.15	2	8		
Hanamaulu Res.	682-691	1976-1981	0	10	0		
Hanamaulu A/S Res.	692-699	1975-1981	1	8	0		
Kepahi Pastures	700-706	1976-1980	0	7	0		
Kapaia Res.	707-716	1975-1980	0	10	0		
Kailiiliahinale R.	717-726	1975-'80	3	10	0		
Kapaa Stable Res.	727-735	1975-1980	0	9	0		
Kapaa Str. Est.	736-747	1975-1981	0	13	0		
Lono Res.	748-757	1975-1981	0	10	0		
Moikeha Canal	758-767	1975-1981	0	10	0		
Moikeha Res.	768	1976	0	1	0		
Waialua-Opaekaa	769-788	1955-1980	(42)	18	2	2	1
Paradise Pacifica	789-798	1975-1980	1	10	0		
Pukaki Res.	799-808	1975-1981	0	10	0		
Rodrigues Res.	809-818	1975-1981	0	10	0		
Slogget Res.	819-829	1968-1980	0	11	0		
Twin Res.	830-840	1975-1981	0	11	0		
Waikaea Canal	841-851	1975-1981	4	11	0		
Wailua G.C.	852-862	1975-1981	0	11	0		

Table 4. (Cont'd)

Quadrangle & Habitat	Serial No.'s	Census Period	Total Counted	No.Total Counts	Ave.No. Counted	Ave.No. ¹ Counted	Ave.No. ¹ Counted
						1stHalf Period	2ndhalf Period
Wailua Homestead	866-872	1965-1980	3	7	0		
Wailua Jail Swamp	873-884	1975-1981	0	11	0		
HANAPEPE							
Aaka res.	885-892	1975-1981	0	8	0		
Alexander Res.	893-900	1975-1981	0	8	0		
Ekahi res.	910-906	1975-1981	0	6	0		
Elima Res.	907-916	1975-1981	0	10	0		
Elua Res.	917-926	1975-1980	0	10	0		
Hanapepe Taro	927-937	1975-1980	1	11	0		
Hanapepe SP	938-954	1968-1980	5	15	0		
Hanapepe Valley	955-956	1963,1966	(9)	2	5	5	4
Hukiwai Res.	957-966	1975-1980	0	10	0		
Ioleau Res.	967-976	1976-1980	0	10	0		
Ipuolono Res.	977-987	1975-1981	0	11	0		
Kaawamui Res.	988-994	1975-1979	0	7	0		
Kalaeloa Res.	995-1001	1975-1979	0	7	0		
Kalaheo Gulches	1002	1976,1977	2	3	1	0	1
Kapa Res.	1003-1012	1975-1980	0	10	0		
Kaumakani Gulch	1013-1025	1975-1981	0	12	0		
Kiaha Res.	1026-1036	1975-1981	0	11	0		
Kuhumu Res.	1037	1979	0	1	0		
Maele Res.	1038-1047	1976-1981	0	10	0		
Manieniula Res.	1048-1057	1975-1980	10	10	1	2	0
Mau Res.	1058-1067	1975-1980	0	10	0		
Nomilo FP	1068-1076	1976-1981	0	9	0		
Nonopahu Res.	1077-1085	1975-1981	0	9	0		
Olokele SB	1086-1096	1975-1981	0	11	0		
Poopueo Res.	1097-1105	1975-1980	1	9	0		
Pulani Res.	1106-1113	1975-1979	0	8	0		
Puu O Papai	1114-1124	1975-1981	7	11	1	0	1
Umi Res.	1125-1135	1975-1981	0	11	0		
Wahiawa Bridge	1136-1144	1976-1980	0	9	0		
Wahiawa MF	1145	1963-1966	77	22	4		
Waikai Res.	1146-1153	1975-1979	0	8	0		
Waikoloi Res.	1154-1161	1975-1981	0	8	0		
Waimea Taro	1162-117-	1975-1980	0	9	0		
KOLOA							
Aepo Res.	1174-1183	1975-1980	0	10	0		
Aepoalua Res.	1184-1192	1975-1980	1	9	0		
Aepoeha Res.	1193-1202	1975-1980	0	10	0		
Aepoekolu Res.	1203-1212	1975-1980	0	10	0		
Grove Farm SB	1213-1223	1975-1981	26	11	2	1	3
Grove farm TP	1224-1245	1962-1980	(45)	17	3	5	0

Table 4. (Cont'd)

Quadrangle & Habitat	Serial No.'s	Census Period	Total No. Counted	Total Counts	Ave.No. Counted	Ave.No. ¹ Counted	Ave.No. ¹ Counted
						1stHalf Period	2ndHalf Period
Halenanahu Res	1246-1254	1975-1980	0	9	0		
Hanini Res.	1255-1264	1975-1980	0	10	0		
Huinawai Res.	1265-1274	1975-1980	0	10	0		
Kaupale Res.	1275-1285	1975-1980	0	11	0		
Kipu Res. (4)	1286-1288	1970-1977	53	2	27	16	37
Kipu Res. #1	1289-1299	1974-1980	2	10	0	0	
Kipu Res. #2	1300-1312	1973-1980	36	12	3	5	1
Kipu Res. #3	1313-1325	1973-1980	56	12	5	6	4
Kipu Res. #4	1326-1340	1968-1980	126	14	9	13	5
Kipu Res. #5	1341	1974	1	1	1		
Kipu Road Res.	1342-1353	1975-1981	0	12	0		
Koloakaapohu Res.	1354-1363	1975-1980	5	10	1	0	1
Kumano Res.	1364-1375	1975-1981	3	12	0		
Lawai Kai Est.	1376-1382	1976-1980	0	7	0		
Loko Res.	1383-1391	1975-1980	0	9	0		
Luawai Res.	1392-1400	1976-1980	0	9	0		
Mahalepu Ponds	1401-1411	1974-1980	2	11	0		
Manuhonuhonu Res.	1412-1422	1975-1981	0	11	0		
Mauka Res.	1423-1432	1975-1980	2	10	0		
Omao Res.	1433-1442	1975-1980	0	10	0		
Papuaa Res.	1443-1451	1975-1980	0	9	0		
Papuaa Ridge Res.	1452-1453	1978-1979	0	2	0		
Pia Mill Res.	1454-1463	1975-1980	0	10	0		
Piwai Res.	1464-1471	1975-1981	2	8	0		
Pinau Res.	1472-1483	1975-1981	0	12	0		
Poipu Area	1484-1505	'958-1981	(15)	17	1	3	0
Puuihi Res.	1506-1514	1975-1980	0	9	0		
Puu O Hewa Res.	1515-1525	'975-1980	0	11	0		
Waita Res.	1526-1549	1946-1980	(74)	19	4	5	3
LIHUE							
Ahukini Res.	1550-1583	1961-1980	(40)	15	3	3	2
Aweoweonui Valley	1584-1596	1969-1980	16	12	1	3	0
Hospital Ditch	1597-1603	1964-1965	(29)	7	4	5	4
Halaha Res.	1604-1614	1975-1981	0	11	0		
Huleia NWR	1615-1654	1974-1982	268	40	7	6	7
Huleia Valley	1655	1977	2	2	1		
Menehune FP	1656-1672	1968-1980	43	16	3	3	3
Nawiliwili LA	1673	1964	(8)	1	8		
Kauai Surf G.C.	1674-1683	1975-1980	0	10	0		
Kauai Surf Hotel	1684-1692	1975-1980	4	9	0		
Lihue PSB	1693-1721	1965-1980	(120)	24	5	9	1
Niumalu Flats	1722-1724	1977-1980	0	4	0		
Puhi Canefield	1725-1727	1965	(12)	3	4	2	2
Waikaia Res.	1728-1735	1975-1980	0	8	0		

¹ average rounded to nearest whole number² includes 3 "peak" counts in 1st half period

* average daily use data converted to that of single count

() includes unobserved adults associated with downy young or nest seen

Table 5.

Records of Koloa Downy Young (DY), Nests (N),
and Eggs (E) seen, 1955-1970, Island of Kaua'i

Quadrangle & Habitat	Number Seen	Date	Appendix Serial No.
HAENA			
Kokee			
in Alakai nr. Waialae Camp	4 DY	17 Dec. 1956	143
on Kokee Stream	5 DY	5 Mar. 1963	144
	3 DY	8 Apr. 1966	149
on Mohihi Stream	3 DY	27 July 1965	145
Wainiha			
Haena Taro	8 E	17 Feb. 1963	152
Haena Taro	1 DY	19 Mar. 1963	153
HANALETI			
Anini Taro	1 DY	6 May 1964	165
Hanalet Valley	6 E	8 July 1960	168
	5 DY	30 Jan. 1963	169
	2 DY	15 Feb. 1964	170
	9 E	27 Apr. 1965	172
Hanalet taro	1 DY	2 Feb. 1963	177
	3 DY	6 Jan. 1965	178
	6 DY	6 Apr. 1965	180
	2 DY	6 Nov. 1965	181
Hanalet River	2 DY	26 Dec. 1964	211
	4 DY	4 Dec. 1965	213
	6 DY	10 Mar. 1966	213
Kalihiwai River	2 DY	27 Oct. 1965	279
	4 DY	29 Oct. 1965	280
Lumahai River	2 DY	4 May 1966	305
	4 (DY)	Apr. 1976	315
Wilcox Ponds	6 DY	Jan. 1975	357
ANAHOLA			
Kaloko Reservoir	1 (DY)	24 Aug. 1960	374
Kilauea Town	10 E	11 Oct. 1963	447
Waipahee Stream	1 DY	19 Feb. 1966	480
KAPAA			
Wailua-Opaekaa	10 E	7 Feb. 1955	770
	3 DY	14 Mar. 1962	772
	6 E	2 Apr. 1965	774
	4 DY	25 Apr. 1966	775
HANAPEPE			
Hanapepe Valley	3 DY	30 Mar. 1963	955
	2 DY	22 June 1966	956

Table 5 (Cont'd)

Quadrangle & Habitat	Number Seen	Date	Appendix Serial No.
KOLOA			
Grove Farm TP	several DY	7 Apr. 1962	1224
	6-8 DY	14 Nov. 1962	1225
	1 DY	4 Dec. 1962	1226
	several DY	23 Sept. 1963	1227
	6 DY	28 Jan. 1965	1229
	1 DY	19 Mar. 1965	1231
Poipu Area	1 DY	21 Jan. 1958	1484
	1 DY	4 May 1964	1486
Waita (Koloa) Res.	5 DY	16 Jan. 1963	1528
LIHUE			
Ahukini Reservoir	1 DY	6 July 1964	1552
	10 DY	9 Apr. 1965	1555
	2 DY	27 May 1965	1556
	2 broods	Apr. 1970	1566
Ditch-Wilcox Hospital	4	31 May 1964	1597
	2	22 Nov. 1964	1598
	3	7 Mar. 1964	1599
	1	11 Apr. 1965	1600
	3	17 Apr. 1965	1601
	3	31 May 1965	1602
Nawiliwili Lighthouse	6 DY	10 Dec. 1964	1673
Lihue Plantation	3 DY	22 Apr. 1965	1693
Puhi Canefield	3 DY	25 Jan. 1965	1725
	1 DY	23 Mar. 1965	1726
	2 DY	6 Apr. 1965	1727

Table 6.

Aerial Counts of Koloa by HDFG on Ni'ihau, 1970-1981

Year	January	July/August	Source
1970		3	1738
1971-1973	(no data)	(no data)	
1974		7	1739
1975		56*	1741
1976	16	16	1742, 1743
1977	6	1	1744, 1746
1978	45	3 (?1)	1747, 1748, 1748a
1979	0	9	1749, 1750
1980	0	3	1751, 1752
1981	0		1753

* 35 on reservoir east of village, 16 on broad tidal ponds and ditches, 5 on north shore ponds (1757-1759).

Table 7.

Summary of Koloa Censused by HDFG by Quadrangle,
1956-1982, Island of Kaua'i

Habitat	Serial No.'s	Census Period	Total No. Counted	Total Counts	Ave.No.* Counted
Haa0 Reservoir	1760-1761	1976-1977	10	2	5
Halalii Lk.& Ditches	1762-1770	1947-1980	24	9	3
Halulu Lk.& Ditches	1771-1778	1976-1980	0	8	0
Kaalialinui Valley	1779	1979	0	1	0
Kaumuhonu Reservoir	1780	1980	0	1	0
Kaunui Reservoir	1781	1978	2	1	2
Keanauhi Reservoir	1782-1786	1976-1980	9	5	2
Kiekie Pond(s)	1787-1791	1977-1980	0	5	0
Nonopapa Lake	1792-1798	1977-1980	0	7	0
Palikoe Pond	1799	1978	0	1	0
Pohueloa Reservoir	1800-1803	1977-1980	26	4	7
Puu Alala Pond(s)	1804-1807	1978-1980	0	4	0
Puuwai Pond(s)	1808-1809	1978	10	2	5

* average rounded to nearest whole number

Table 8.

Koloa Censused by HDFG in 13 Quadrangles, 76 Habitats,
Island of O'ahu, 1975-1982

Quadrangle & Habitat	Serial No.'s	Census Period	Total No. Counteds	Total Counts	Ave.No. Counteds	Ave.No. ¹	Ave.No. ¹
						Counteds	Counteds
KAENA							
Kapaluaa B/S	1901-1905	1976-1980	0	5	0		
Mokuleia Complex	1907-1915	1975-1980	2	9	0		
HALEIWA							
Haleiwa Complex	1917-1923	1976-1980	5	7	1	1	0
Helemano Res.	1924-1927	1978-1980	0	4	0		
Kaiaka Bay	1929	1976	0	1	0		
Kawailoa	1930	1976	0	1	0		
Tsuruda Hasu	1931	1979	0	1	0		
Ukoa P/M	1932-1941	1975-1980	0	10	0		
Waialua SB	1944-1947	1975-1980	0	4	0		
WAIANAE							
Makaha P/S	1948-1953	1975-1978	0	6	0		
Waianae Dump	1954-1955	1976-1977	0	2	0		
Yamaguchi	1956-1958	1976-1977	0	3	0		
SCHOFIELD BARRACKS							
Lualualei NAD	1959-1969	1975-1980	1	10	0		
EWA							
Campbell IP	1970-1979	1975-1980	0	10	0		
WAI MEA ⁵							
Waialea Res.	1869-1873	1976-1980	10 ⁵	5	2		
Waimea Falls Arb.	1874-1889	1977-1980	158 ^{5,3}	16	10		
Waimea falls Park	1890-1898	1977-1980	58 ^{5,4}	8	7		
Kahuku, JCNWR ²	1980-2005	1979-1981	19	24	1	1	0
Kii, JCNWR ²	2006-2057	1975-1982	121	50	2	2	4
Punamano, JCNWR	2058-2086	1975-1982	14	29	0		
Punahoolapa, JCNWR	2087-2095	1977-1980	18	9	2	3	1
Kahuku Airstrip	2096-2099	1976-1979	1	4	0		
Lowe Prawn Farm	2100-2101	1979-1980	0	2	0		
Laie Prawn Farm	2101-2103	1979-1980	1	2	1		
Kualoa Pond	2104-2112	1975-1980	0	9	0		
Kuilima Complex	2113-2122	1975-1980	0	10	0		
Kuilima GC	2123	1977	0	1	0		
Kahuku Aquafarm	2124-2125	1979-1980	0	2	0		
Kawela CF	2126	1979	0	1	0		
Waiapuka	2127	1977	2	1	2		

Table 8 (Cont'd)

Quadrangle & Habitat	Serial No.'s	Census Period	Total Counted	No.Total Counts	Ave.No. Counted	Ave.No. ¹	Ave.No. ¹
						Counted 1stHalf Period	Counted 2ndHalf Period
HAUULA							
Ku Tree Res.	2128-2132	1979-1981	0	4	0		
Opaela Res.	2133-2134	1981	0	1	0		
Wahiawa Res.	2135-2136	1979	0	2	0		
KAHANA							
Huilua Pond	2138-2148	1975-1981	0	10	0		
Kahana Stream	2149	1978	2	1	2		
Punaluu FF	2150	1977	0	1	0		
WAIPAHI							
Apokaa	2151-2160	1975-1980	0	10	0		
LC Taro	2161-2162	1975-1976	0	2	0		
PC Peninsula	2163-2164	1975-1976	0	2	0		
Waiawa, PHNWR ²	2165-2221	1976-1982	28	53	1	1	0
Sumida Farm	2222-2224	1975-1976	0	3	0		
Makalena GC	2225	1976	0	1	0		
Waipahu Dump	2226-2235	1975-1980	0	10	0		
Waipio Sewage	2236-2240	1975-1980	0	5	0		
Waikele	2241-2249	1975-1980	0	9	0		
KANEHOHE							
Heeia Complex	2250-2256	1976-1980	5	7	1	1	0
Kahaluu Pond	2257	1976	0	1	0		
Kaelepulu FC	2272-2276	1976-1979	14	3	5	2	5
Kaelepulu Canal	2277-2279	1977	2 ⁸	1	2		
Kailua	2282	1977	2	1	2		
Kaneohe MCAS	2289-2293	1975-1980	1	5	0		
Nuupia, MCAS	2296d-2316	1977-1980	97 ⁹	11	9		
Kaneohe, MCAS SL	2317-2326	1977-1980	6 ¹⁰	10	1	1	0
Kawainui	2327-2382	1975-1980	487 ¹¹	42	12		
Hamakua-Kawainui	2383-2395	1976-1980	47 ¹²	11	4	1	0
Kawainui Berm	2396-2398	1978-1980	0	3	0		
Hamakua-Maunawili	2399-2403	1978-1980	22	5	4	4	1
Hamauka-Wigwam	2404-2407	1975-1978	3	3	1	0	2
Ianikai	2408-2410	1977-1978	33	3	11	5	17
Olomana SC	2411	1979	0	1	0		

Table 8 (Cont'd)

Quadrangle & Habitat	Serial No.'s	Census Period	Total Counted	No.Total Counts	Ave.No. Counted	Ave.No. ¹ Counted	Ave.No. ¹ Counted
						1stHalf Period	2ndHalf Period
PUULOLOA							
Waipio	2421-2424	1977-1978	17	2	9	6	11
Waipio Basin	2425-2430	1975-1980	0	6	0		
Waipio Peninsula	2431-2444	1976-1981	26	11	2	2	3
Walker's Bay	2445-2454	1975-1980	0	10	0		
West Loch, PHNWR ²	2455-2523	1975-1982	14	53	0		
Fort Kam	2524-2533	1975-1980	0	10	0		
Honouliuli	2534-2542	1975-1980	0	9	0		
HONOLULU							
Keehi Lagoon	2544-2553	1975-1980	0	10	0		
Kaau Crater	2560	1977	2	1	2		
Manoa Stream	2567	1976	1	1	1		
Nuuanu Reservoirs	2568-2583	1975-1981	11	16	1	1	1
Salt Lake	2586-2599	1975-1980	0	10	0		
KOKO HEAD							
Bellows AFB	2604-2614	1975-1981	3	11	0		
Kuapa Pond	2615	1976	0	1	0		
Paiko Lagoon	2616-2625	1975-1980	0	10	0		

- ¹ average recorded to nearest whole number
² average daily use data converted to that of single census
³ does not include three broods (3-2-2 ducklings at last count)
⁴ does not include 1 brood w/ 4 ducklings seen once
⁵ data presumably represent released captive-raised Koloa or their mature progeny
⁶ does not include 1 brood of 5 ducklings seen
⁷ does not include 1 brood of 7 ducklings seen
⁸ does not include 1-6 ducklings seen at various times
includes 48 captive-raised Koloa released during period
does not include 1-7 ducklings seen at various times
includes 117 captive-raised Koloa released during period
does not include 2 broods totaling 12 ducklings seen

Table 9.

Captive-Raised Koloa Released on O'ahu, 1968-1982

Numbers	Release site	Date	Propagator/Liberator	Reference No.
<hr/>				
		<u>1968</u>		
12	Kapiolani Park	13 May	Honolulu Zoo	2562
		<u>1969</u>		
32	Kawainui	17 Jan.	HDFG	2331
		<u>1972</u>		
4	Lualualei NAD	16 Aug.	HDFG	1959
		<u>1954</u>		
24	Kawainui	3 Mar.	HDFG	2335
11	Waimea falls	28 May	San Antonio/Honolulu Zoos	1890
6	Kaneohe MCAS	5 June		2296
19	Kaneohe MCAS	15 Nov.		2295
21	Kawainui	29 Nov.		2336
4	Kaneohe MCAS	(?1974)		2288
		<u>1976</u>		
29	Kawainui	27 Feb.	HDFG	2343
29	Kawainui	4 Mar.	HDFG	2343
		<u>1977</u>		
15	Kaneohe MCAS	mid Feb.	HDFG	2299
20	Waimea Falls	23 Feb.	HDFG	1874
20	Kaneohe MCAS	27 Feb.	HDFG	2300
34	Kawainui	11 Mar.	HDFG	2361
26	Waimea falls Park	30 Nov.	HDFG	1874
27	Kawainui	30 Nov.	HDFG	2371
		<u>1978</u>		
1	Kaneohe MCAS	25 Aug.	HDFG	2311a
		<u>1979</u>		
32 (?31)	Kawainui	17 Apr.	HDFG	2378
46	Waimea Falls Park	19 Apr.	HDFG	1882
		<u>1982</u>		
37	Ho'omaluhia Park	7 Apr.	HDFG	(55)
1	Ho'omaluhia Park	14 Apr.	HDFG	(55)
<hr/>				
450	Total Koloa Released on O'ahu			

Table 10.

Captive-raised Koloa Observed on O'ahu
in Localities Other Than Release Site

Number		Location	Site	Date	Record
1	28 Mar. 1976	Manoa Stream	Kawainui	Feb. 1976	2567
1	12 Apr. 1977	Kahuku Airstrip	Waimea Falls	(Feb. 1977)	2098
1	21 June 1977	Kaneohe MCAS SL	Kawainui	unknown	2319
4	2 Nov. 1979	Waimea Falls	Kawainui	17 Apr. 1979	1883
2	5 Nov. 1979	Haleiwa Complex	Kawainui	17 Apr. 1979	1920

Table 11.

Results of Breeding by Liberated Captive-Raised
Koloea or Their Progeny, O'ahu, 1968-1982

Observation	Location	Date	Appendix Record
1977			
2 ad., 1 yng.	Kaelepulu-Hamakua	24 Jan.	2277
2 ad., 6 yng.	Kaelepulu-Hamakua	late Jan.	2278
1 ad., 6 yng.	Kaneohe MCAS SL	7 Mar.	2317
(1 ad.), 4 yng.	Kaneohe MCAS SL	15 May	2322
1 ad., 1 yng.	Kaneohe MCAS SL	30 May	2318
1 ad., 7 yng.	Kaneohe MCAS SL	23 June	2320
1 ad., 1 yng.	Kaneohe MCAS SL	28 June	2321
1 ad., 4 yng.	Waimea Falls	17 Apr.	1875
1 ad., 4 yng.	Waimea Falls	15 May	1876
1 ad., 3 yng.	Waimea Falls	27 June	1877
1978			
1 ad., 6 yng.	Hamakua-Kawainui	(6 May)	2389
1 ad., 2 yng.	Hamakua-Kawainui	1 June	2389
1 ad., 2 yng.	Hamakua-Kawainui	11 June	2389
2 ad., 12 yng.	Hamakua-Kawainui	2 July	2390
2 ad., 7 yng.	Kahana Stream	21 May	2149
1979			
1 ad., 5 yng.	Waimea Falls	7 Nov.	1884
remains of 2 nests	Waimea Falls	17 Nov.	1885
1 ad., 2 yng.	Waimea Falls	4 Dec.	1886
1980			
1 ad., 4 yng.	Waimea Falls	23 Jan.	1897
1 ad., 2 yng.	Waimea Falls	26 June	1889

Table 12.

Koloea Censused by HDFG on Hawai'i, 1958-1981

Year	January	July/August	Other	Appendix No.
1958	(0)			2695a
1959	no census			2695b
1960	1			2696
1961	(0)			2696a
1962	(0)			2696b
1963	0			2697
1964	(0) *			2698
1965	0			2699
1966	(0)			2699a
1967	(0)			2699b
1968	0			2700
1969	0	0		2701, 2702
1970	0	0		2704, 2705
1971	0	0		2706, 2707
1972	0	0		2708, 2709
1973	5	0	0 (June)	2710, 2711
1974	1	0		2713, 2714
1975	3	0		2715, 2717
1976	11	3		2718, 2720
1977	0	0		2721, 2722, 2723
1978	3	0		2725, 2726
1979	0	0		2727, 2728
1980	26	29		2729, 2730
1981	2			2731

() Koloea not identified among water birds censused

* excludes an unlikely unexplained report of 45

Table 13.

Captive-raised and Released Koloa,
Island of Hawai'i, 1958-1980

Total No.	Male	Female	Release Site	Date	Reference Source	Appendix No.
21	unknown	unknown	Kahua Ranch	12 Dec. 1958	PATP81	2805
4	unknown	unknown	Kahua Ranch	1 Aug. 1959	SWEG69	2808
52	30	22	Kahua Ranch	6 Dec. 1968	HDFG	2815
44	23	21	Kahua Ranch	12 Nov. 1969	HDFG	2818
42	19	23	Kahua Ranch	6 Nov. 1970	HDFG	2821
53	30	23	Kahua Ranch	29 Dec. 1971	HDFG	2825
55	29	26	Kahua Ranch	14 Nov. 1972 ¹	HDFG	2828 (55)
55	29	26	Kahua Ranch	14 Nov. 1973	HDFG	2835
47 ^{2,3}	28	19	Kahua Ranch	14 Jan. 1974	HDFG	2838
43	25	18	Kahua Ranch	25 Oct. 1979	HDFG	2845
58	32	26	Wailuku River	1 Dec. 1980	PATP81	2737a (55)
----- 474	----- 245+	----- 204+				

¹ disagrees with PATP81 (2836) who cites 18 Nov. 1972

² disagrees with PATP81 (2839a) who has 44

³ disagrees with HAWS75 (2839b) who lists 48

Table 14.

Koloa Observed and/or Censused by HDFG
in 22 Habitats, Island of Hawai'i, 1958 to 1981

Quadrangle & Habitat	Serial No.s	Observation Period	Total No. Counted	Total Counts	Ave.No. Counted
HAWI					
Kehena Ponds/Ditch ¹	2741-2777	1970-1980	185	30	6
Puu Okomau	2778-2785	1976-1980	0	8	0
Union Mill	2786-2793	1976-1980	0	8	0
Upolu-Biogenics	2794-2801	1976-1980	0	8	0
KAWAIHAE					
Kahua Ranch P/R ¹	2805-2849	1958-1981	114	25	5
KUKUIHAELE					
Kukuihaele	2853-2861	1976-1980	0	9	0
Ialakea	2862-2869	1976-1980	0	8	0
Waipio Valley	2870-2881	1976-1981	0	8	0
PUU HINAI					
Francis Brown	2882-2889	1976-1980	0	8	0
MAKALAWENA					
Opaeha	2890-2900	1976-1980	1	10	0
KEAHOLE POINT					
Aimakapa	2901-2909	1976-1980	0	9	0
Kaloko	2910-2919	1976-1981	0	10	0
HUALALAI					
Huehue Mauka	2920-2926	1976-1980	0	7	0
KA LAE					
Kaalualu	2929-2937	1976-1980	0	9	0
NAALEHU					
Honuapo	2938-2944	1977-1981	0	7	0
PUNALUU					
Punaluu	2946-2952	1976-1980	0	7	0
KEAAU RANCH					
Keaau	2953-2959	1976-1979	0	7	0
HILO					
Ahn	2969-2977	1976-1980	0	9	0
Nakagawa	2978-2986	1976-1980	0	9	0
Wailoa	2988-2996	1976-1980	0	9	0
HONOKAA					
Honokaa Mill	2997-2998	1976-1977	0	2	0
Kukaiau	2999-3006	1976-1980	0	8	0

¹ excluding liberated stock on day of release

Table 15.

Sightings of Young Produced in the Wild by
Liberated Captive-Raised Koloa,
Island of Hawai'i, 1958-1981

Observation/Report	Date	Location	Appendix No.
broods of 1,2 reported	12 July 1959	Kahua Ranch	2807
6 young	20 Mar. 1971	Kehena Ponds/Ditch	2742
8 young	16 Apr. 1971	Kahua Ranch	2822
3 broods reported	(1971)	unspecified	2826
10 young	14 June 1972	Kehena	2746
several broods reported	(1972)	unspecified	2830
1 dead duckling found	15 Jan. 1973	Kehena	2751
6 ducklings	4 June 1973	Kehena	2755
4 ducklings	Mar. 1974	Kehena	2762
5 ducklings	Mar. 1974	Hamakua Ditch	2851
4 young	Apr. 1974	Kehena	2762
reproduction observed each year	(1971-1974)	unspecified	2842

Table 16.

Distribution by Decade of 3,014 Koloa Records
in the Hawaiian Islands, 1778-1981

1770's - 1	1850's - 0	1920's - 4
1780's - 0	1860's - 0	1930's - 6
1790's - 2	1870's - 5	1940's - 33
1800's - 0	1880's - 6	1950's - 23
1810's - 0	1890's - 22	1960's - 210
1820's - 2	1900's - 13	1970's - 2,196
1830's - 0	1910's - 3	1980-
1840's - 3		1981 - 485

APPENDIX

1. Observations, reports, and specimen records are organized by island group, island, district, and/or quadrangle map. Order of listing, names and locations of district and quadrangle boundaries are explained and illustrated in CPSU/UH Avian History Report 4: Introduction to Part I, Population Histories--Species Accounts.
2. Acronyms composed of the first three letters of the author's (or senior author's) last name, the initial letter of the first name, and last two digits of the year of publication represent sources found in the bibliography under References Cited. For example, BRYW01 = Bryan, W.A. and Alvin Scale. 1901. Notes on the birds of Kauai. Bishop Museum Occ. Papers. 1(3): 129-137. In cases where it is necessary to distinguish between two or more articles published by an author in any given year, letters are added to the acronym in alphabetical sequence, e.g., BRYW01a = Bryan, W.A. 1901. A key to the birds of the Hawaiian group. Bishop Museum Press. 76 pp. Parenthetical numbers such as (5), represent references listed under Unpublished Sources Cited in the bibliography.
3. Place-names are cited in original form.
4. Parenthetical information is qualified.

Relative Abundance/Locality	Date	Source

Southeastern Hawaiian Islands		
1 frequents fresh water only / "Hab. whole group"	(1879)	DOLS79
2 Banko: Wilson collected 1 specimen / unspecified island	1888	(10)
3 "large series" / of specimens sent by Palmer from Kaua'i, Hawai'i, Ni'ihau, and O'ahu	(1891/1893)	ROTW00
4 noticed it plentifully...in some localities becoming much scarcer than formerly and in others has practically disappeared / in many localities on Kaua'i, O'ahu, Moloka'i, Maui and Hawai'i...equally at home on the hottest coasts where suitable ponds are found, or in the mountains where I have noticed it as high as 7,000 feet...	(1892/1896)	PERR03
5 a common bird...in coastal lagoons, marshes and mountain streams / on all islands except Lāna'i and Kahoolawe	(1890's)	MUNG44
6 getting scarcer every year / in all parts of the group	(1901)	BLAJ01
7 becoming scarcer and scarcer every year / unspecified	(1902)	HENH02
8 of recent years they have become very rare / except on the island of Kaua'i	(1915)	BRYW15
9 Banko: Henshaw, Judd, Perkins, Seale, Townsend, Whitney, G.B. and S. Wilder took about 30 specimens / O'ahu, Kaua'i Hawai'i	1891-1946	(10)
9a found only on Kaua'i, Ni'ihau and O'ahu	(1946-1947)	SCHC49
10 HDFG: 17 / Kaua'i, O'ahu, Moloka'i, Maui, Hawai'i	14-18 Jan. 1963	(1)
11 HDFG: 70 (includes unverified and unlikely report of 45 from Hawai'i) / Kaua'i, O'ahu, Moloka'i, Maui, Hawai'i	15 Jan. 1964	(1)
12 HDFG: 3 / Kaua'i, O'ahu, Maui, Hawai'i	13,14 Jan. 1966	(1)
13 HDFG: 26 / Kaua'i, O'ahu, Moloka'i, Maui, Hawai'i	13-16 Jan. 1967	(1)
14 HDFG: 20 (all on Kaua'i) / Kaua'i, O'ahu, Moloka'i, Maui, Hawai'i	8-10 Jan. 1968	(1)
15 HDFG: 30 (all on Kaua'i) / Kaua'i, O'ahu, Moloka'i, Maui, Hawai'i	13,14 Jan. 1969	(1)
16 HDFG: officially classed as endangered	(1969)	(7)
17 HDFG: 29 / Kaua'i, Ni'ihau, O'ahu, Moloka'i, Maui, Kawai'i	7 Aug. 1970	(22)
17a HDFG: found on Hawai'i, O'ahu, Kaua'i and Ni'ihau	(1975)	(50)

- 18 HDFG: Objectives...of Statewide summer and winter surveys 1 July 1975 - (2)
 is to determine abundance and distribution of population, 30 June 1976
 and to record environmental factors affecting numbers and
 distribution...and...to measure effects of habitat
 improvement projects at Kanaha Pond, Maui, and Paiko Lagoon,
 O'ahu...Procedures...include...one-day comprehensive air and/or
 ground coverage of all significant habitats by HDFG, USFWS and
 other qualified cooperators...following of prescribed routes
 by experienced observers using binoculars and telescopes...
 and notation of environmental conditions affecting efficiency
 and results obtained...
- 19 Shallenberger: Captive-reared birds have been released on (1977) (3)
 both Hawai'i and O'ahu to restore those populations, but it
 is questionable whether or not these birds are breeding
 successfully in significant numbers. It may be several years
 before the success or failure of this project is confirmed.
- 20 Shallenberger: Numbers recorded during semi-annual surveys (1977) (3)
 by State and Federal biologist probably bear little relationship
 to actual populations, as the species is very widely distributed
 but rarely concentrated
- 21 Shallenberger:...currently listed as endangered by State (1977) (3)
 and Federal laws / formerly found on all larger main islands
 and Ni'ihau
- 22 HDFG: comprehensive semi-annual censuses are only useful 1 July 1977 - (2)
 as comparative indices to total population and 30 June 1978
 distributional patterns
- 23 captive-reared populations have been released in recent (1978) SHAR77
 years...but it may be several years before the success of
 this project is determined / Hawai'i and O'ahu
- 24 presents some historical highlights of population (1978) SHAR77
 decline / Statewide
- 25 HDFG: 84 21 July, 1 Aug. 1980 (5)
- 26 HDFG: 67 12-14 Jan. 1981 (5)
- 27 modest population increases during the last decade...to (1982) ANON82
 around 1,000...improvement is a direct result of protection
 and wetland enhancement...releases have been made into the
 wild...(species) fairly secure...any reduction of management
 activities by state or federal government could be disastrous
 ...recovery plan being drafted...

Island of Kaua'i

ISLANDWIDE INFERENCE

28	estimate 500 birds remain...from our sample counts and information from resident hunters, plantation workers, and other observers	(1946, 1947)	SCHC53
29	found densities up to 4 birds per mile of stream / on the major mountain streams from 500 to 4,000 ft. elevation	(1946, 1947)	SCHC53
30	probably more than half (the estimated 500 island population) / major mountain streams from 500 to 4,000 ft. elevation	(1946, 1947)	SCHC53
31	HDFG: conspicuous by their absence...annual waterfowl count	14-17 Jan. 1958	(1)
32	HDFG: 44	7-16 Jan. 1959	(1)
33	resident in small numbers / along streams or on reservoirs near the coast, but especially along the least-frequented streams to about 4,000 feet into the mountains	(June-Aug. 1960)	RICF64
34	HDFG: 12	4-8 Jan. 1960	(1)
35	HDFG: 27	10-13 Jan. 1961	(1)
36	HDFG: 15	15-17 Jan. 1962	(1)
37	HDFG: 17	14-18 Jan. 1963	(1)
37a	HDFG: Under present conditions, the occurrence of anything that should be termed a flock (on Kaua'i) is extremely rare. Pairs and singles are the rule throughout the year, though groups of approximately half a dozen are not common, especially at certain localities. For example, in one instance (Nov. 11, 1962 - Koloa Reservoir), 32 birds were seen in one flock. This number is far above the next highest sighting of 13 birds observed in a pool in Waimea Canyon. Such a large gathering is believed to be the result of an unusually favorable food supply or the seasonal utilization of a favorite resting or loafing bar. These situations occur immediately after a reservoir has been lowered sufficiently to expose large mud flats. Some pairing probably takes place under such conditions, but it is believed that the birds do not concentrate solely for this purpose.	Nov. 1962-Nov. 1963	(49)

that should be termed a flock (on Kaua'i) is extremely rare. Pairs and singles are the rule throughout the year, though groups of approximately half a dozen are not common, especially at certain localities. For example, in one instance (Nov. 11, 1962 - Koloa Reservoir), 32 birds were seen in one flock. This number is far above the next highest sighting of 13 birds observed in a pool in Waimea Canyon. Such a large gathering is believed to be the result of an unusually favorable food supply or the seasonal utilization of a favorite resting or loafing bar. These situations occur immediately after a reservoir has been lowered sufficiently to expose large mud flats. Some pairing probably takes place under such conditions, but it is believed that the birds do not concentrate solely for this purpose.

One of the most noticeable characteristic of the koloa is its willingness to abandon an area at the first sign of disturbance. Trapping efforts at Waita and Ahukini Reservoirs, which involved the firing of the cannon net or running down young ducklings, usually caused the ducks to avoid these areas for a few days to a week.

In many cases, it appears that the koloea may utilize a number of sites on the same day even without outside disturbances. Also, at irregular intervals, some or all of the individuals will leave a location and will not return for several days. Whether they arrive en masse at another destination, or split up into singles and pairs, is unknown.

Although most of the large areas of koloea habitat on Kaua'i, such as the Mana Swamp, have been destroyed, the number of remaining streams, ditches, ponds and reservoirs is substantial enough that once the ducks are flushed it is virtually impossible to relocate the birds. Because of their habit of flying very low, which prevents their being silhouetted against the sky, it is usually difficult to determine the direction of flight. Since the island of Kaua'i is quite small (approximately 555 square miles), virtually all areas are within flying distance. None of the birds in the wild have been banded or otherwise individually identified, so it is impossible to determine whether the birds seen in a particular location are the same or are different from those in other locations. An accurate population estimate will be virtually impossible until a banding program is initiated.

During the period covered by this report, a number of surveys were made of the mountain streams of Kaua'i. These surveys, coupled with observations made in previous years, show that some relationships exists between the number of miles of permanent streams and the number of ducks in an area. At present, the ratio appears to be approximately one duck per two miles of stream.

38	HDFG: 25	15 Jan. 1964	(1)
39	HDFG: 21	13-15 Jan. 1965	(1)
40	HDFG: 2	13,14 Jan. 1966	(1)
41	3,000...estimated from 55 found in lowland areas (563 observations of 12 habitats surveyed), + 2,887 projected in upland areas (from 122 of 2,092 miles of permanent and intermittent streams, and ditches, actually surveyed) / Islandwide	(1962-1966)	SWEG67
42	HDFG: 26	13-16 Jan. 1967	(1)
43	HDFG: 20	8-10 Jan. 1968	(1)
44	HDFG: 6	24 July 1968	(1)
45	HDFG: 30	13, 14 Jan. 1969	(1)

- 46 HDFG: 26 7 Aug. 1970 (22)
- 47 HDFG: average number using selected habitats less than one half that estimated by Swedberg in 1967 1 July 1970 - (8)
30 June 1971
- 48 HDFG: lowland surveys indicated that a stable population exists but that distribution changes markedly from season to season. Ten were marked and released but no re-sightings were recorded. Congregations in two open pasture areas were noted to occur after dusk and this may indicate that some may move down from the uplands during the night...One nest from which four were reared in captivity and subsequently released, was discovered in Kekaha alfalfa field 1 July 1971 - (8)
30 June 1972
- 49 HDFG: duckling mortality appears to be one of the greatest limiting factors, since brood sizes have been noted to decrease rapidly as age increases... 1 July 1971 - (8)
30 June 1972
- 50 HDFG: 64 1 Aug. 1975 (2)
- 51 HDFG: addition of several new areas to the quarterly waterbird census route indicated that previous surveys of koloa were inadequate in determining population trends... 1970-1975 (8)
It was apparent from the more complete coverage that previous results accounted for only a small portion of the actual lowland population. Even with adequate coverage of the 45 habitat areas, the sample may have been too small to adequately measure the status of koloa on Kaua'i. The koloa is so mobile that it is difficult to get consistent lowland census results. Many more island-wide surveys would have to be conducted to obtain an accurate assessment...This year's results were more accurate because the Assistant Refuge Manager of Hanalei NWR made a concentrated census of the Refuge during the fall, winter and spring quarters. Koloa numbers ranged between 19 and 38 in the HNWR during those three surveys, averaging 30.7 koloa each. This showed that Hanalei is actually the most important lowland koloa habitat on Kaua'i ...importance of various lowland habitats to koloa was identified in an analysis of quarterly census results for the past five years. Hanalei NWR was the most heavily used, followed by Kipu Reservoirs, Kekaha pasture and the Mana ponds...broods seen this year ranged from 2 to 6 in number...survival appeared to be very poor and was probably a major factor limiting population growth...
- 52 HDFG: 85 15 Jan. 1976 (2)

53	HDFG: The large number counted on winter and summer surveys was partially attributable to the expanded number of habitats censused this year	1 July 1975 - 30 June 1976	(2)
54	HDFG: 78	Aug. 1976	(2)
55	HDFG: 143	Jan. 1977	(2)
56	HDFG: Koloa preferred areas not inhabited by migratory waterfowl	1 July 1976 - 30 June 1977	(2)
57	HDFG: severe winter drought...record numbers recorded	1 July 1976 - 30 June 1977	(2)
58	HDFG: 54	27,28 July 1977	(2)
59	Shallenberger:...occupy a wide variety of natural and man-made habitats...although HDFG/USFWS count coverage... is broad, it is certain that many birds in streams, irrigation ditches and flooded pastures are missed on survey	(1977)	(3)
60	HDFG: 54	12,13 Jan. 1978	(2)
61	HDFG: sharp decrease in numbers censused is attributed to severe drought in 1977, and the consequent lack of sufficient productivity to offset annual mortality...many that normally migrate to Ni'ihau remained on Kaua'i for the second winter in a row	1 July 1977 -	(2)
62	population reportedly large until the 1920's, but then began to decline rapidly...hunting closed in 1925	(1977)	SHAR78a ⁵
63	3,000 estimated	(1977)	SHAR78a
64	HDFG: 51	15,16,20 Jan. 1979	(5)
65	HDFG: 45	1,2 Aug. 1979	(5)
66	HDFG: 49	14-16 Jan. 1980	(5)
67	HDFG: 28	31 July, 1 Aug. 1980	(5)
68	HDFG: 33	12-14 Jan. 1981	(5)

UNSPECIFIED LOCALITIES/LOCATION(S)

69	Banko: Palmer collected 6 specimens	28 Jan.-13 Mar. 1891	(10)
70	Seale: saw...fourteen...3 specimens taken...3 more were seen later / along the turbulent mountain stream Wailie (? Waialae)	(1900)	BRYW15
71	Miller: unsuccessful hunts two mornings and evenings / marsh and pond back of the (? Lihue) mill	2 Apr. 1903	(26)
72	from one to two...observed per linear mile / along some of the permanently-fed large irrigation ditches which flow through the sugarcane fields or connect one field with another	(1946-1947)	SCHC53

73	two to three ducks...occasionally seen / on two to ten acre reservoirs	(1946-1947)	SCHC53
74	occurs very sparsely / below 500 feet...in the reservoirs, major irrigation ditches, the very few remaining marshy area, the coastal portions of some of the larger streams, and some flooded rice fields	(1946-1947)	SCHC53
75	3 juveniles seen / unspecified location	8 Dec. 1954	SWEG67
76	2 downy young seen / unspecified location	3 Apr. 1956	SWEG67
77	2 juveniles seen / unspecified location	23 Dec. 1957	SWEG67
78	at least 26 seen / in widely scattered localities ranging from streams in such high, wet, forested canyons as the upper Hanalei Valley south of Keanaawi Ridge, to small coastal streams in quite arid canyons such as Milolii (where 6 were seen)	(June-Aug. 1960)	RICF64
79	2 seen / on a farm pond off main highway Lihue to Kokee	3 Mar. 1961	KINB61
80	2 seen / grassy pond about 5 miles west of Kekaha on Highway 50	4 Mar. 1961	KINB61
80a	HDFG: 13 observed / pool in Waimea Canyon	Nov. 1962-Nov. 1963	(49)
81	HDFG: 55 seen on 28 surveys along 78.25 miles of stream (.70 ducks/mile)...sample too small to be statistically significant	1 July 1963 - 30 June 1964	(32)
82	2 flushed / from the plantation road on the way to the Lihue power house	27 Apr. 1965	SWEG67
83	HDFG: 6 seen in 5 surveys along 9.25 miles of stream (.60 ducks/mile)...sample too small to be statistically significant	1 July 1964 - 30 June 1965	(31)
84	127 seen in 44 surveys along 85 of 1,537 miles of 16 of 30 permanent upland habitats (over ca. 1000 ft. elevation) / (unspecified streams)	(1962-1966)	SWEG67
85	13 seen in 10 surveys along 22.5 of 320 miles of 5 of 15 intermittent upland habitats (over ca. 1000 ft. elevation) / (unspecified streams)	(1962-1966)	SWEG67
86	28 seen in 9 surveys along 14 of 235 miles of 7 of 17 upland habitats (over ca. 1000 ft. elevation) / (unspecified ditches)	(1962-1966)	SWEG67
87	55 can be expected to be seen at any given time on 12 selected lowland (under ca. 1000 ft. elevation) habitats (viz., Mana, Kekaha, Kaumakani, Hanapepe Salt Pond, Wahiawa Mud Flats, Poipu Area, Grove Farm Cane Trash Pile, Waita	(1962-1966)	SWEG67

- Reservoir, Lihue Plantation Settling Basin, Ahukini Reservoir,
Wailua Pasture Lands, Hanalei Taro Patches
- 88 66 young were seen or reported (mostly from 1962-1966) (1956-1966) SWEG67
every month of year except August in natural to man-made,
wild to disturbance-prone, habitats ranging from sea level
to 3500 ft. elevation (ave. 516 ft. elevation)
- 89 HDFG: 53 released in widely separated localities...marking Apr. 1967 (1)
indicators had disappeared by August

MULTIQUADRANGLE/MULTILOCALITY

- 90 Eric Knudsen reports two favorite spots for collecting (1946-1947) SCHC53
ducks / Kokee and Waialae
- 91 not reported / Alakai Swamp (1946-1947) SCHC53
- 92 none seen on 3-day trip / to Koaie cabin and beyond 21-23 Sep. 1964 WALR64
- 93 HDFG: average of 4.7 seen in 14 observations all year; 10 1 July 1963 - (32)
was largest number seen per survey... / taro patches 30 June 1964
(Hanalei to Haena)
- 94 HDFG: average of 5.2 seen in 8 observations all year; 12 1 July 1964 - (31)
was largest number seen per survey / taro patches (Hanalei 30 June 1965
to Haena)
- 95 14, Christmas Count / main belt road from Wailua to Kokee 29 Dec. 1970 SEAW71
...Mana and Wailua rice and taro beds between Houselots and
Homesteads Road
- 96 37, Christmas Count / streams, holding ponds, and 27 Dec. 1971 SEAW72
irrigation ditches...within a 15 mile diameter circle,
center north of Belt Road between Puhi and Koloa exits to
include south of Wailua middlefork to Kalaheo and Hanapepe
Valley
- 97 6, Christmas Count / rivers, streams and holding ponds... 27 Dec. 1971 SEAW72
within a 15 mile diameter circle, center foothill junction
of Makaleha and Anahola Mts. to include north of Wailua
middlefork to Hanalei Bay
- 98 27, Christmas Count / Lihue area Dec. 1971 SEAW79
- 99 26, Christmas Count / Lihue area Dec. 1972 SEAW79
- 100 5, Christmas Count / Lihue area 16 Dec. 1973 HARA74
- 101 5, Christmas Count / Lihue area Dec. 1973 SEAW79
- 102 45, Christmas Count / Kapaa area, center foothill junction 14 Dec. 1974 SEAW75
of Makaleha and Anahola Mountains
- 103 2, Christmas Count / Lihue area, center N of belt road 15 Dec. 1974 SEAW75

between Puhi and Koloa exits to include south of Wailua
middlefork to Kalaheo and Hanapepe Valley

104	2, Christmas Count / Lihue area	Dec. 1974	SEAW79
105	10, Christmas Count / Lihue area	Dec. 1975	SEAW79
106	58, Christmas Count / Lihue area	Dec. 1976	SEAW79
107	25, Christmas Count / Oceanside of Belt Road from Wailua River to Kalapaki Bay, Paradise Pacifica, Holding ponds west of Lihue to Wailua Falls, Ponds west of Waita Reservoir	17 Dec. 1977	SEAW78
108	10, Christmas Count / Nawiliwili Harbor, Menehune Fishpond to Knudsen Gap Road, oceanside of Koloa Sugar Mill	17 Dec. 1977	SEAW78
109	14, Christmas Count / Huleia Stream, Waita Reservoir, Kahili Mtn. Park (latter mostly rained out)	17 Dec. 1977	SEAW78
110	17, Christmas Count / Kapaa area	18(?) Dec. 1977	KAWD78
111	49, Christmas Count / Lihue area	Dec. 1977	SEAW79
112	2, Christmas Count / Lihue: Wailua River to north side of Lihue	16 Dec. 1978	SEAW79
113	2, Christmas Count / Lihue: Kaua'i Surf Golf Course to Knudsen Gap Road incl. Waita Reservoir	16 Dec. 1978	SEAW79
114	43, Christmas Count / Count center was foothill junction of Makaleha and Anahola mountains (as in 1977)	24 Dec. 1978	KAWD79
115	19, Christmas Count / Lihue: south side of Lihue to Knudsen Gap Road incl. Waita Reservoir	15 Dec. 1979	ANON80
116	7, Christmas Count / Lihue: Wailua River to north side of Lihue and west to Wailua Falls	15 Dec. 1979	ANON80
117	30, Christmas Count / area of undescribed parameters near Kapaa	22 Dec. 1979	ANON80
118	5, Christmas Count / south of Lihue to Knudsen Gap Road, incl. Kipu Ranch and Waita Reservoir	(Dec. 1980)	SEAW81
119	2, Christmas Count / Lihue: Wailua River to north side of Lihue, incl. airport road and holding ponds west to Lihue	(Dec. 1980)	SEAW81

QUADRANGLE/LOCALITY

MAKAHA POINT

Kolo Reservoir

120	HDFG: 0	1 Aug. 1975	(1)
121	HDFG: 0	15 Jan. 1976	(2)
121a	HDFG: rarely or never used	1 July 1975 - 30 June 1976	(14)

122 HDFG: 0	4,5 Aug. 1976	(2)
123 HDFG: 0	13 Jan. 1977	(2)
124 HDFG: 0	27,28 July 1977	(2)
125 HDFG: 0	12,13 Jan. 1978	(2)
126 HDFG: 0	27,28,30 July 1978	(5)
127 HDFG: 0	15,16,20 Jan. 1979	(5)
128 HDFG: 0	1,2 Aug. 1979	(5)
129 HDFG: 0	14-16 Jan. 1980	(5)
130 HDFG: 0	12 Jan. 1981	(5)

Saki Mana Reservoir

131 HDFG: 0	1 Aug. 1975	(1)
132 HDFG: 3	15 Jan. 1976	(2)
133 HDFG: 0	4,5 Aug. 1976	(2)
134 HDFG: 0	13 Jan. 1977	(2)
135 HDFG: 0	27,28 July 1977	(2)
136 HDFG: 0	12,13 Jan. 1978	(2)
137 HDFG: 0	15,16,20 Jan. 1979	(5)
138 HDFG: 0	1,2 Aug. 1979	(5)
139 HDFG: 0	14-16 Jan. 1980	(5)
140 HDFG: 0	31 July, 1 Aug. 1980	(5)

HAENA

Haena Pond/Marsh

141 HDFG: 1	8-10 Jan. 1968	(1)
142 Shallenberger: (none observed during two visits, 20 May, 21 July 1977)...unaware of any records...marsh is badly encroached by grasses...only a small (10'x20') oval of open water (was present)	(1977)	(3)

Kokee Area

143 Schwartz and Schwartz: 4 downy young seen in Alakai near Waialae Camp	17 Dec. 1956	SWEG67
144 5 downy young seen on Kokee Stream	5 Mar. 1963	SWEG67
145 3 downy young seen on Mohihi Stream	27 July 1965	SWEG67

146	4 juveniles seen on Waiakoali Stream	28 July 1965	SWEG67
147	saw pair on 1st river forded by vehicle on way to Alakai Swamp trailhead	Sep. 1965	HANJ66
148	pair seen on stream crossed by trail into USGS Koaie River cabin	Sep. 1965	HANJ66
149	3 downy young seen on Kokee Stream	8 Apr. 1966	SWEG67
150	1 flushed near headwaters, Waiakoali Stream	Sep. 1967	WOLJ69
151	present	8 July-2 Sep. 1970	PLEJ70

Wainiha Taro/River Fields

152	8 eggs found (Haena taro)	17 Feb. 1963	SWEG67
153	1 downy young seen (Haena taro)	19 Mar. 1964	SWEG67
154	HDFG: 0	1 Aug. 1975	(1)
155	HDFG: 0	15 Jan. 1976	(2)
156	HDFG: 0	4,5 Aug. 1976	(2)
157	HDFG: 0	13 Jan. 1977	(2)
158	HDFG: 0	27,28 July 1977	(2)
159	Shallenberger:...only one seen on the stream...several others in flight...surveyed 20 May, 22 July 1977	(1977)	(3)
160	HDFG: 0	12,13 Jan. 1978	(2)
161	HDFG: 0	27,28,30 July 1978	(5)
162	HDFG: 0	15,16,20 Jan. 1979	(5)
163	HDFG: 0	1,2 Aug. 1979	(5)
164	HDFG: 0	14-16 Jan. 1980	(5)

HANALEI

Anini Taro Patch

165	1 downy young seen	6 May 1964	SWEG67
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Hanalei Valley

166	HDFG: 7	4-10 Jan. 1956	(1)
167	2 seen	9 May 1957	CURA58
168	nest with 6 eggs at ca. 1800 ft. elevation	8 July (1960)	RICF64
169	5 downy young seen in marsh	30 Jan. 1963	SWEG67
170	2 downy young seen in Moody Pasture	15 Feb. 1964	SWEG67
171	2 seen	19-22 Mar. 1964	SCHP65

172	9 eggs found in Princeville Ranch River pasture	27 Apr. 1965	SWEG67
173	HDFG: 1	13-15 Jan. 1970	(1)
174	8, Christmas Count	30 Dec. 1973	HARA74
175	HDFG: 2.5 average seen on 10 of 20 quarterly censuses	1970-1975	(8)
176	Schallenberger: 3 flushed from Hanalei River during surveys of 19,31 May and 18,21 July 1977...presumably the ephemerally flooded pasture, both on and off the Hanalei NWR provides important habitat...none seen in lower Hanalei taro fields, but they do appear in past count records for the area...at least a dozen historical and several recent observations of nesting have been made.	(1977)	(3)

Hanalei Taro Patches (154 acres in 1964)

177	1 downy young seen	2 Feb. 1963	SWEG67
178	3 downy young seen	6 Jan. 1965	SWEG67
179	1 juvenile seen	26 Jan. 1965	SWEG67
180	6 downy young seen	6 Apr. 1965	SWEG67
181	2 downy young seen	6 Nov. 1965	SWEG67
182	4 seen	16-23 Nov. 1966	ORDW67
183	656 seen in 37 censuses	(1963-1966)	SWEG67
184	Banko: maximum of 16 censused in 21 HDFG counts...actual number probably higher due to insufficient coverage	(1966)	(17)
185	HDFG: 1	8-10 Jan. 1968	(1)
186	HDFG: 1	7 Aug. 1970	(22)
187	HDFG: 1	14 Sep. 1970	(12)
188	HDFG: 2	8 Aug. 1973	(1)
189	HDFG: 2	9 Aug. 1973	(1)
190	HDFG: 2	15 Nov. 1973	(1)
191	HDFG: 5	2 Aug. 1974	(1)

Hanalei Post Office Taro Fields

192	HDFG: 0	1 Aug. 1975	(1)
193	HDFG: 0	15 Jan. 1976	(2)
194	HDFG: 0	4,5 Aug. 1976	(2)
195	HDFG: 0	13 Jan. 1977	(2)
196	HDFG: 0	27,28 July 1977	(2)
197	HDFG: 0	12,13 Jan. 1978	(2)
198	HDFG: 0	27,28,30 July 1978	(5)

199 HDFG: 7
 200 HDFG: 0
 201 HDFG: 1

15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Hanalei Trader Taro Fields

202 HDFG: 0
 203 HDFG: 0
 204 HDFG: 4
 205 HDFG: 1
 206 HDFG: 0
 207 HDFG: 0
 208 HDFG: 2
 209 HDFG: 0
 210 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Hanalei River

211 2 downy young seen
 212 4 downy young seen
 213 6 downy young seen near bridge
 214 HDFG: 0
 215 HDFG: 0
 216 HDFG: 0
 217 HDFG: 0
 218 HDFG: 0
 219 HDFG: 0
 220 HDFG: 0
 221 HDFG: 0
 222 HDFG: 0
 223 HDFG: 0
 224 HDFG: 0

26 Dec. 1964 SWEG67
 4 Dec. 1965 SWEG67
 10 Mar. 1966 SWEG67
 1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 31 July, 1 Aug. 1980 (5)
 12 Jan. 1981 (5)

58

Hanalei National Wildlife Refuge

225 119, all-time high
 226 68...high count
 227 easily observed
 228 Shallenberger:...recent thorough surveys suggest that the
 refuge is the single most important lowland habitat on

15 Feb. 1977 ZEIF77
 11 Mar. 1977 PYLR77
 19 Mar. 1977 WATJ77
 (1977) (3)

Kaua'i for this species...also that refuge management has significantly improved conditions for this species

229 107, peak	mid-Mar. 1977	PYLR78
230 USFWS: 15 ave. daily use	Oct. 1979	(13)
231 USFWS: 25 ave. daily use	Nov. 1979	(13)
232 USFWS: 15 ave. daily use	Dec. 1979	(13)
233 USFWS: 15 ave. daily use	Jan. 1980	(13)
234 USFWS: 12 ave. daily use	Feb. 1980	(13)
235 USFWS: 22 ave. daily use	Mar. 1980	(13)
236 USFWS: 0 ave. daily use	Apr. 1980	(13)
237 USFWS: 22 ave. daily use	May 1980	(13)
238 USFWS: 18 ave. daily use	June 1980	(13)
239 USFWS: 2 ave. daily use	July 1980	(13)
240 USFWS: 2 ave. daily use	Aug. 1980	(13)
241 USFWS: 16 ave. daily use	Sep. 1980	(13)
242 USFWS: 12 ave. daily use	Oct. 1980	(13)
243 USFWS: 4 ave. daily use	Nov. 1980	(13)
244 USFWS: 7 ave. daily use	Dec. 1980	(13)
245 USFWS: 12 ave. daily use	Jan. 1981	(13)
246 USFWS: 19 ave. daily use	Feb. 1981	(13)
247 USFWS: 14 ave. daily use	Mar. 1981	(13)
248 USFWS: 20 ave. daily use	Apr. 1981	(13)
249 USFWS: 17 ave. daily use	May 1981	(13)
250 USFWS: 4 ave. daily use	June 1981	(13)
251 USFWS: 0 ave. daily use	July 1981	(13)
252 USFWS: 0 ave. daily use	Aug. 1981	(13)
253 USFWS: 0 ave. daily use	Sep. 1981	(13)
254 USFWS: not censused	15 Nov.-15 Dec.1981	(13)
255 USFWS: 54, ave. daily use	16 Dec. 1981 -	(13)
	15 Jan. 1982	
256 USFWS: 21, ave. daily use	16 Feb.-31 Mar. 1982	(13)
257 USFWS: 30, ave. daily use	Apr. 1982	(13)
258 USFWS: 30, ave. daily use	May 1982	(13)
259 USFWS: 15, ave. daily use	June 1982	(13)

Hanalei National Wildlife Refuge, Lookout Survey

260 HDFG: 14	1 Aug. 1975	(1)
261 HDFG: 7	15 Jan. 1976	(2)
262 HDFG: 14	4,5 Aug. 1976	(2)

263 HDFG: 20
 264 HDFG: 6
 265 HDFG: 0
 266 HDFG: 15
 267 HDFG: 14
 268 HDFG: 0
 269 HDFG: 10

13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Hanalei National Wildlife Refuge, Auto/Foot Survey

270 HDFG: 6
 271 HDFG: 20
 272 HDFG: 30
 273 HDFG: 33
 274 HDFG: 3
 275 HDFG: 28
 276 HDFG: 0
 277 HDFG: 5
 278 HDFG: 0
 279 HDFG: 8

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Kalihiwai River Estuary

280 2 downy young seen on stream
 281 4 downy young seen on stream
 282 HDFG: 0
 283 HDFG: 7
 284 HDFG: 0
 285 HDFG: 1
 286 HDFG: 0
 287 HDFG: 0
 288 HDFG: 0
 289 HDFG: 0
 290 HDFG: 0
 291 HDFG: 0
 292 HDFG: 0
 293 HDFG: 0

27 Oct. 1965 SWEG67
 29 Nov. 1965 SWEG67
 1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July, 1 Aug. 1980 (5)
 12 Jan. 1981 (5)

Kalihiwai Reservoir

294 HDFG: 1	1 Aug. 1975	(1)
295 HDFG: 0	15 Jan. 1976	(2)
296 HDFG: 0	4,5 Aug. 1976	(2)
297 HDFG: 0	13 Jan. 1977	(2)
298 HDFG: 0	27,28 July 1977	(2)
299 HDFG: 0	12,13 Jan. 1978	(2)
300 HDFG: 0	27,28,30 July 1978	(5)
301 HDFG: 0	15,16,20 Jan. 1979	(5)
302 HDFG: 0	1,2 Aug. 1979	(5)
303 HDFG: 0	14-16 Jan. 1980	(5)

Kalihiwai Bog (base of steep ridge, Kamookoa)

304 Shallenberger: single koloa sighted flying above trees 2 June 1977...Telfer reported small flocks flushed from this area but unable to provide estimate as to how many might inhabit this forested bog	(1977)	(3)
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Kalihiwai Prawn Farm

305 HDFG: 0	12,13 Jan. 1978	(2)
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Lumahai River/Estuary

306 2 downy young seen	4 May 1966	SWEG67
307 2 juveniles seen	4 May 1966	SWEG67
308 HDFG: 3	24 July 1968	(1)
309 HDFG: 1	7 Aug. 1970	(22)
310 HDFG: .50 was average number seen on 5 of 20 quarterly censuses conducted	1970-1975	(8)
311 HDFG: 0	1 Aug. 1975	(1)
312 HDFG: 3	15 Jan. 1976	(2)
313 HDFG: 2	4,5 Aug. 1976	(2)
314 HDFG: 8	13 Jan. 1977	(2)
315 HDFG: 6	27,28 July 1977	(2)
316 Shallenberger: 5 seen on our 20 May survey and 7 during 21 July...Abundant cover probably prevented observation of additional ducks...observation of a female with a brood of four in April 1976 confirms use of the area for breeding. Koloea were seen on 23 of 46 USFWS trips during 1974-1977,	(1977)	(3)

but never more than eight birds were recorded from the roadside site...birds appear to use the estuary and stream year-round.

317 HDFH: 1	12,13 Jan. 1978	(2)
318 HDFG: 0	27,28,30 July 1978	(5)
319 HDFG: 0	15,16,20 Jan. 1979	(5)
320 HDFG: 4	1,2 Aug. 1979	(5)
321 HDFG: 1	14-16 Jan. 1980	(5)

Princeville Golf Course Ponds

322 HDFG: 0	1 Aug. 1975	(1)
323 HDFG: 0	15 Jan. 1976	(2)
324 HDFG: 0	4,5 Aug. 1976	(2)
325 HDFG: 0	13 Jan. 1977	(2)
326 HDFG: 0	27,28 July 1977	(2)
327 HDFG: 0	12,13 Jan. 1978	(2)
328 HDFG: 0	27,28,30 July 1978	(5)
329 HDFG: 2	15,16,20 Jan. 1979	(5)
330 HDFG: 1	1,2 Aug. 1979	(5)
331 HDFG: 0	14-16 Jan. 1980	(5)

Waioli Taro Fields

332 HDFG: 0	1 Aug. 1975	(1)
333 HDFG: 0	15 Jan. 1976	(2)
334 HDFG: 0	4,5 Aug. 1976	(2)
335 HDFG: 0	13 Jan. 1977	(2)
336 HDFG: 1	27,28 July 1977	(2)
337 HDFG: 3	12,13 Jan. 1978	(2)
338 HDFG: 1	27,28,30 July 1978	(5)
339 HDFG: 3	15,16,20 Jan. 1979	(5)
340 HDFG: 0	1,2 Aug. 1979	(5)
341 HDFG: 2	14-16 Jan. 1980	(5)

Waipio Taro Fields

342 HDFG: 0	1 Aug. 1975	(1)
343 HDFG: 8	15 Jan. 1976	(2)
344 HDFG: 0	4,5 Aug. 1976	(2)
345 HDFG: 13	13 Jan. 1977	(2)

346 HDFG: 0	27,28 July 1977	(2)
347 HDFG: 0	12,13 Jan. 1978	(2)
348 HDFG: 0	27,28,30 July 1978	(5)
349 HDFG: 1	15,16,20 Jan. 1979	(5)
350 HDFG: 1	1,2 Aug. 1979	(5)
351 HDFG: 0	14-16 Jan. 1980	(5)

Wilcox Ponds

352 HDFG: 0	1 Aug. 1975	(1)
353 HDFG: 0	15 Jan. 1976	(2)
354 HDFG: 0	4,5 Aug. 1976	(2)
355 HDFG: 0	13 Jan. 1977	(2)
356 HDFG: 0	27,28 July 1977	(2)
357 Shallenberger: single pair flushed 22 July...as many as 11 have been recorded on previous visits by State and Federal biologists...brood of six downy young in Jan. 1975 verified use of this area for nesting but not aware of any other records...trampling of bordering pasture probably inhibits more frequent use for nesting	(1977)	(3)
358 HDFG: 0	12,13 Jan. 1978	(2)
359 HDFG: 0	27,28,30 July 1978	(5)
360 HDFG: 0	15,16,20 Jan. 1979	(5)
361 HDFG: 0	1,2 Aug. 1979	(5)
362 HDFG: 2	14-16 Jan. 1980	(5)

ANAHOLA

Anahola Estuary

363 HDFG: 0	1 Aug. 1975	(1)
364 HDFG: 0	15 Jan. 1976	(2)
365 HDFG: 0	4,5 Aug. 1976	(2)
366 HDFG: 0	13 Jan. 1977	(2)
367 HDFG: 0	27,28 July 1977	(2)
368 Shallenberger: one flushed from wet pasture near the stream on 21 May survey	(1977)	(3)
369 HDFG: 0	12,13 Jan. 1978	(2)
370 HDFG: 0	15,16,20 Jan. 1979	(5)
371 HDFG: 0	1,2 Aug. 1979	(5)

372 HDFG: 0	14-16 Jan. 1980	(5)
373 HDFG: 0	12 Jan. 1981	(5)

Kaloko Reservoir

374 fledgling seen in an irrigation ditch southwest of Koloko Reservoir	24 Aug. 1960	RICF64
375 HDFG: 2	1 Aug. 1975	(1)
376 HDFG: 0	15 Jan. 1976	(2)
377 HDFG: 0	4,5 Aug. 1976	(2)
378 HDFG: 0	13 Jan. 1977	(2)
379 HDFG: 0	27,28 July 1977	(2)
380 HDFG: 0	12,13 Jan. 1978	(2)
381 HDFG: 0	27,28,30 July 1978	(5)
382 HDFG: 0	15,16,20 Jan. 1979	(5)
383 HDFG: 0	1,2 Aug. 1979	(5)
384 HDFG: 0	14-16 Jan. 1980	(5)

Kaloko Prawn Farm

385 HDFG: 0	12,13 Jan. 1978	(2)
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Kamoku Pastures

386 HDFG: 0	1 Aug. 1975	(1)
387 HDFG: 2	15 Jan. 1976	(2)
388 HDFG: 0	4,5 Aug. 1976	(2)
389 HDFG: 2	13 Jan. 1977	(2)
390 HDFG: 0	27,28 July 1977	(2)
391 HDFG: 0	12,13 Jan. 1978	(2)
392 HDFG: 0	27,28,30 July 1978	(5)
393 HDFG: 0	15,16,20 Jan. 1979	(5)
394 HDFG: 0	1,2 Aug. 1979	(5)
395 HDFG: 0	14-16 Jan. 1980	(5)

Kaneha Reservoir

396 HDFG: 0	1 Aug. 1975	(1)
397 HDFG: 0	15 Jan. 1976	(2)
398 HDFG: 0	4,5 Aug. 1976	(2)

399 HDFG: 2
 400 HDFG: 0
 401 HDFG: 0
 402 HDFG: 0
 403 HDFG: 0
 404 HDFG: 0

13 Jan. 1977 (2)
 27,28, July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Kanehu Reservoir #1

405 HDFG: 0
 406 HDFG: 0
 407 HDFG: 0
 408 HDFG: 0
 409 HDFG: 0
 410 HDFG: 0
 411 HDFG: 0
 412 HDFG: 0
 413 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July,1 Aug. 1980 (5)

Kanehu Reservoir #2

414 HDFG: 0
 415 HDFG: 2
 416 HDFG: 0
 417 HDFG: 0
 418 HDFG: 0
 419 HDFG: 0
 420 HDFG: 1
 421 HDFG: 0
 422 HDFG: 0
 423 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July,1 Aug. 1980 (5)
 12 Jan. 1981 (5)

Kanehu Reservoir #3

424 HDFG: 0
 425 HDFG: 0
 426 HDFG: 0
 427 HDFG: 0
 428 HDFG: 4
 429 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)

430 HDFG: 0	1,2 Aug. 1979	(5)
431 HDFG: 0	14-16 Jan. 1980	(5)
432 HDFG: 0	31 July, 1 Aug. 1980	(5)
433 HDFG: 0	12 Jan. 1981	(5)

Kilauea Estuary

434 1 seen	19-22 Mar. 1964	SCHP65
435 2 lost to botulism	15 Dec. 1966 -	SWEG67
	23 Jan. 1967	
436 HDFG: 0	1 Aug. 1975	(1)
437 HDFG: 0	15 Jan. 1976	(2)
438 HDFG: 0	4,5 Aug. 1976	(2)
439 HDFG: 1	13 Jan. 1977	(2)
440 HDFG: 0	27,28 July 1977	(2)
441 Shallenberger: surveyed from the road to the beach and by boat in the stream...two observed on 20 May but none seen on 23 July 1977 survey...included in HDFG/USFWS semi-annual waterbird surveys only in last three years... no more than two koloa have been noted on these surveys, although the present study suggests that a boat is required for thorough coverage	(1977)	(3)
442 HDFG: 0	12,13 Jan. 1978	(2)
443 HDFG: 0	15,16,20 Jan. 1979	(5)
444 HDFG: 0	1,2 Aug. 1979	(5)
445 HDFG: 0	14-16 Jan. 1980	(5)
446 HDFG: 0	12 Jan. 1981	(5)

Kilauea Town

447 nest with 10 eggs found .5 m W, .25 m S Kilauea town	11 Oct. 1963	SWEG67
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Mimino Reservoir

448 HDFG: 0	1 Aug. 1975	(1)
449 HDFG: 0	15 Jan. 1976	(2)
450 HDFG: 0	12,13 Jan. 1978	(2)

Morita Reservoir

451 HDFG: 3	1 Aug. 1975	(1)
452 HDFG: 0	15 Jan. 1976	(2)
453 HDFG: 0	4,5 Aug. 1976	(2)
454 HDFG: 0	13 Jan. 1977	(2)
455 HDFG: 0	27,28 July 1977	(2)
456 HDFG: 0	12,13 Jan. 1978	(2)
457 HDFG: 0	27,28,30 July 1978	(5)
458 HDFG: 2	15,16,20 Jan. 1979	(5)
459 HDFG: 0	1,2 Aug. 1979	(5)
460 HDFG: 0	14-16 Jan. 1980	(5)

Puu Ka Ele Reservoir

461 HDFG: 0	1 Aug. 1975	(1)
462 HDFG: 0	15 Jan. 1976	(2)
463 HDFG: 0	4,5 Aug. 1976	(2)
464 HDFG: 3	13 Jan. 1977	(2)
465 HDFG: 0	27,28 July 1977	(2)
466 HDFG: 0	12,13 Jan. 1978	(2)
467 HDFG: 0	27,28,30 July 1978	(5)
468 HDFG: 0	15,16,20 Jan. 1979	(5)
469 HDFG: 0	1,2 Aug. 1979	(5)
470 HDFG: 0	14-16 Jan. 1980	(5)

Waiakalua Reservoir

471 HDFG: 0	1 Aug. 1975	(1)
472 HDFG: 2	15 Jan. 1976	(2)
473 HDFG: 0	4,5 Aug. 1976	(2)
474 HDFG: 3	13 Jan. 1977	(2)
475 HDFG: 0	27,28 July 1977	(2)
476 HDFG: 0	12,13 Jan. 1978	(2)
477 HDFG: 0	27,28,30 July 1978	(5)
478 HDFG: 0	15,16,20 Jan. 1979	(5)
479 HDFG: 0	1,2 Aug. 1979	(5)

Waipahee Stream

480 1 downy young seen

19 Feb. 1966

SWEG67

KEKAHA

Kekaha

481 21 seen in 15 observations

(1963-1966)

SWEG67

Kekaha Pasture

482 HDFG: 1	15 Jan. 1974	(1)
483 HDFG: 2	1 Aug. 1975	(1)
484 HDFG: 4.4 was the average number seen in 8 of 20 quarterly censuses conducted	1970-1975	(8)
485 HDFG: 5	15 Jan. 1976	(2)
486 HDFG: 0	4,5 Aug. 1976	(2)
487 HDFG: 0	13 Jan. 1977	(2)
488 HDFG: 7	27,28 July 1977	(2)
489 HDFG: 0	12,13 Jan. 1978	(2)
490 HDFG: 3	27,28,30 July 1978	(5)
491 HDFG: 2	15,16,20 Jan. 1979	(5)
492 HDFG: 0	1,2 Aug. 1979	(5)
493 HDFG: 1	14-16 Jan. 1980	(5)

89

Kekaha Settling Basin

494 USFWS: 6	14 Sep. 1970	(12)
495 HDFG: 0	1 Aug. 1975	(1)
496 HDFG: 0	15 Jan. 1976	(2)
497 HDFG: 0	4,5 Aug. 1976	(2)
498 HDFG: 0	13 Jan. 1977	(2)
499 HDFG: 0	27,28 July 1977	(2)
500 HDFG: 0	12,13 Jan. 1978	(2)
501 HDFG: 0	27,28,30 July 1978	(5)
502 HDFG: 0	15,16,20 Jan. 1979	(5)
503 HDFG: 0	1,2 Aug. 1979	(5)
504 HDFG: 1	14-16 Jan. 1980	(5)

Kekaha Slaughterhouse Reservoir

505 USFWS: 4	14 Sep. 1970	(120)
506 HDFG: 0	1 Aug. 1975	(1)

507 HDFG: 0
 508 HDFG: 0
 509 HDFG: 0
 510 HDFG: 0
 511 HDFG: 0
 512 HDFG: 0
 513 HDFG: 0
 514 HDFG: 0
 515 HDFG: 0

15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Kahelunui Reservoir

516 HDFG: 0
 517 HDFG: 0
 518 HDFG: 0
 519 HDFG: 0
 520 HDFG: 0
 521 HDFG: 0
 522 HDFG: 0
 523 HDFG: 0
 524 HDFG: 0
 525 HDFG: 0
 526 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July, 1 Aug. 1980 (5)
 12 Jan. 1981 (5)

Mana Base Pond

527 HDFG: 0
 528 HDFG: 2
 528aHDFG: resident

 529 HDFG: 0
 530 HDFG: 3
 531 HDFG: 0
 532 HDFG: 0
 533 HDFG: 0
 534 HDFG: 0
 535 HDFG: 0
 536 HDFG: 0
 537 HDFG: 0

1 Aug. 1975 (2)
 15 Jan. 1976 (2)
 1 July 1975 - (14)
 30 June 1976
 4,5 Aug. 1976 (2)
 5 Jan. 1977 (14)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Mana (Area) Marsh/Ponds/Ditches

538 Perkins: 1 specimen taken	4 May 1895	(15)
539 Woodhouse reported ca. 400 per sq. mile; 2,400 estimated in 6 sq. miles; prior to drainage of marsh	1923	SCHC53
540 reported by residents by the thousands in 3,000 acre swamp	(1923)	SWEG69
541 estimate 5 per sq. mile, or a total of 30 after drainage	(1946-1947)	SCHC53
542 HDFG: average of 4.8 seen in 10 observations from Jan. to Apr.; 17 was most seen per survey; peak period of (loafing) use extended from Aug. to an undetermined month	1 July 1963- 30 June 1964	(32)
543 Banko: HDFG repoort 11 counts during period totaled 48, ranged from 0-24, averaged 2.4...no nesting observed or reported...estimated 30 miles of drainage ditches used sparingly and irregularly year around...flooded pasture used moderately spring and fall...formed marsh now planted to sugarcane (3,800 acres), alfalfa (40 acres), pasture (20 acres)	(1963-1965)	(17)
544 HDFG: average of 0.5 seen in 4 observations from Jan.-Apr.; 2 was largest number seen per survey; Jan.-Apr. was peak period for loafing use	1 July 1964- 30 June 1965	(31)
545 219 seen in 45 surveys	(1963-1966)	SWEG67
546 HDFG: 2	24 July 1968	(1)
547 USFWS: 7	3 Dec. 1968	(12)
548 USFWS: 2	26 May 1970	(12)
549 USFWS: 21 (pastures)	14 Sep. 1970	(12)
550 HDFG: 1	10 Apr. 1974	(1)
551 HDFG: 3.4 average number seen in 11 of 20 quarterly censuses conducted	1970-1975	(8)
552 Shallenberger: observed 6 in flight over the ponds during the 16 May survey but none on the water either at that time or on 20 July ...temporary habitat is provided by miles of drainage ditches and several hundred acres of flooded pasture in nearby Kekaha ...species has been observed in all seasons in both the Brackish and Base Ponds, although the former is favored	(1977)	(3)
553 HDFG: 0 (ditches)	12,13 Jan. 1978	(2)

554 HDFG: 0 (ditches)
555 HDFG: 0 (ditches)

1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Mana Brackish Pond

556 HDFG: 1
557 HDFG: 0
558 HDFG: 1
558aHDFG: resident

2 Aug. 1974 (1)
1 Aug. 1975 (2)
15 Jan. 1976 (2)
1 July 1975 - (14)
30 June 1976
4,5 Aug. 1976 (2)
19 Oct. 1976 (14)
5 Jan. 1977 (14)
13 Jan. 1977 (2)
20 May 1977 (14)
26 May 1977 (14)
14 June 1977 (14)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

559 HDFG: 0
560 HDFG: 2
561 HDFG: 2
562 HDFG: 6
563 HDFG: 3
564 HDFG: 5
565 HDFG: 1
566 HDFG: 0
567 HDFG: 0
568 HDFG: 2
569 HDFG: 0
570 HDFG: 0
571 HDFG: 0

Mana House Reservoir

572 HDFG: 0
573 HDFG: 0
574 HDFG: 0
575 HDFG: 2
576 HDFG: 0
577 HDFG: 0
578 HDFG: 0
579 HDFG: 0
580 HDFG: 0
581 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Mana Reservoir

582 HDFG: 0

15 Jan. 1976 (2)

583 HDFG: 0	4,5 Aug. 1976	(2)
584 HDFG: 0	13 Jan. 1977	(2)
585 HDFG: 0	27,28 July 1977	(2)
586 HDFG: 0	12,13 Jan. 1978	(2)
587 HDFG: 0	15,16,20 Jan. 1979	(5)
588 HDFG: 0	14-16 Jan. 1980	(5)
589 HDFG: 0	31 July, 1 Aug. 1980	(5)
590 HDFG: 0	12 Jan. 1981	(5)

Niu Valley Reservoir

591 HDFG: 0	15 Jan. 1976	(2)
592 HDFG: 0	4,5 Aug. 1976	(2)
593 HDFG: 2	13 Jan. 1977	(2)
594 HDFG: 0	27,28 July 1977	(2)
595 HDFG: 0	12,13 Jan. 1978	(2)
596 HDFG: 0	27,28,30 July 1978	(5)
597 HDFG: 0	15,16,20 Jan. 1979	(5)
598 HDFG: 0	1,2 Aug. 1979	(5)
599 HDFG: 0	14-16 Jan. 1980	(5)

Waiawa Reservoir

600 HDFG: 0	1 Aug. 1975	(1)
601 HDFG: 0	15 Jan. 1976	(2)
602 HDFG: 0	4,5 Aug. 1976	(2)
603 HDFG: 0	13 Jan. 1977	(2)
604 HDFG: 0	27,28 July 1977	(2)
605 HDFG: 0	12,13 Jan. 1978	(2)
606 HDFG: 0	27,28,30 July 1978	(5)
607 HDFG: 0	15,16,29 Jan. 1979	(5)
608 HDFG: 0	1,2 Aug. 1979	(5)
609 HDFG: 0	14-16 Jan. 1980	(5)

Wailau Siphon Reservoir

610 HDFG: 0	4,5 Aug. 1976	(2)
611 HDFG: 0	13 Jan. 1977	(2)
612 HDFG: 0	27,28 July 1977	(2)
613 HDFG: 0	15,16,20 Jan. 1979	(5)

614 HDFG: 0
615 HDFG: 0

1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Waimea Heights Reservoir

616 HDFG: 0
617 HDFG: 0
618 HDFG: 0
619 HDFG: 0
620 HDFG: 0
621 HDFG: 0
622 HDFG: 0
623 HDFG: 0
624 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

WAIMEA CANYON

Kepani Reservoir

625 HDFG: 0

14 Jan. 1981 (5)

U.S.G.S. Koaie Stream Cabin Area

626 2 seen flying down the river
627 2 seen flying up the stream
628 2 seen

3 Sep. 1961 BOWJ62
20 Apr. 1962 ORDW62
14 May 1966 (18)

KAPAA

Aii Reservoir

629 HDFG: 0
630 HDFG: 0
631 HDFG: 0
632 HDFG: 0
633 HDFG: 0
634 HDFG: 0
635 HDFG: 0
636 HDFG: 0
637 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)

638 HDFG: 0
639 HDFG: 0
640 HDFG: 0

14-16 Jan. 1980 (5)
31 July, 1 Aug. 1980
12 Jan. 1981

De Mello Reservoir

641 HDFG: 0
642 HDFG: 0
643 HDFG: 0
644 HDFG: 0
645 HDFG: 0
646 HDFG: 0
647 HDFG: 0
648 HDFG: 0
649 HDFG: 0
650 HDFG: 0
651 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
31 July, 1 Aug. 1980 (5)
12 Jan. 1981 (5)

Fern Grotto Reservoir

652 HDFG: 0
653 HDFG: 0
654 HDFG: 0
655 HDFG: 0
656 HDFG: 0
657 HDFG: 0
658 HDFG: 0
659 HDFG: 0
660 HDFG: 0
661 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1980 (5)
14-16 Jan. 1980 (5)
12 Jan. 1981 (5)

Halaula Reservoir

662 HDFG: 0
663 HDFG: 0
664 HDFG: 0
665 HDFG: 0
666 HDFG: 0
667 HDFG: 0
668 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)

669 HDFG: 0	14-16 Jan. 1980	(5)
Hanahanapuni Reservoir #429		
670 HDFG: 0	1 Aug. 1975	(1)
671 HDFG: 0	15 Jan. 1976	(2)
672 HDFG: 0	4,5 Aug. 1976	(2)
673 HDFG: 0	13 Jan. 1977	(2)
674 HDFG: 0	27,28 July 1977	(2)
675 HDFG: 0	12,13 Jan. 1978	(2)
676 HDFG: 0	27,28,30 July 1978	(5)
677 HDFG: 0	15,16,20 Jan. 1979	(5)
678 HDFG: 0	1,2 Aug. 1979	(5)
679 HDFG: 0	12 Jan. 1981	(5)
Hanamaulu Flats (Kawailoa)		
680 Shallenberger: nearly 15	(1977)	(3)
681 Shallenberger: 0 (after open water had disappeared)	(1977)	(3)
Hanamaulu Reservoir		
682 HDFG: 0	4,5 Aug. 1976	(2)
683 HDFG: 0	13 Jan. 1977	(2)
684 HDFG: 0	27,28 July 1977	(2)
685 HDFG: 0	12,13 Jan. 1978	(2)
686 HDFG: 0	27,28,30 July 1978	(5)
687 HDFG: 0	15,16,20 Jan. 1979	(5)
688 HDFG: 0	1,2 Aug. 1979	(5)
689 HDFG: 0	14-16 Jan. 1980	(5)
690 HDFG: 0	31 July, 1 Aug. 1980	(5)
691 HDFG: 0	12 Jan. 1981	(5)
Hanamaulu Air Strip Reservoir (year drained unknown)		
692 HDFG: 0	1 Aug. 1975	(1)
693 HDFG: 0	15 Jan. 1976	(2)
694 HDFG: 0	27,28 July 1977	(2)
695 HDFG: 0	12,13 Jan. 1978	(2)
696 HDFG: 0	15,16,20 Jan. 1979	(5)

697 HDFG: 0	1,2 Aug. 1979	(5)
698 HDFG: 1	14-16 Jan. 1980	(5)
699 HDFG: 0	12 Jan. 1981	(5)

Kepahi Pastures

700 HDFG: 0	4,5 Aug. 1976	(2)
701 HDFG: 0	13 Jan. 1977	(2)
702 HDFG: 0	27,28 July 1977	(2)
703 HDFG: 0	12,13 Jan. 1978	(2)
704 HDFG: 0	27,28,30 July 1978	(5)
705 HDFG: 0	1,2 Aug. 1979	(5)
706 HDFG: 0	14-16 Jan. 1980	(5)

Kapaia Reservoir

707 HDFG: 0	1 Aug. 1975	(1)
708 HDFG: 0	15 Jan. 1976	(2)
709 HDFG: 0	4,5 Aug. 1976	(2)
710 HDFG: 0	13 Jan. 1977	(2)
711 HDFG: 0	27,28 July 1977	(2)
712 HDFG: 0	12,13 Jan. 1978	(2)
713 HDFG: 0	15,16,20 Jan. 1979	(5)
714 HDFG: 0	1,2 Aug. 1979	(5)
715 HDFG: 0	14-16 Jan. 1980	(5)
716 HDFG: 0	31 July, 1 Aug. 1980	(5)

Kailiiliahinale Reservoir

717 HDFG: 0	1 Aug. 1975	(1)
718 HDFG: 0	15 Jan. 1976	(2)
719 HDFG: 0	4,5 Aug. 1976	(2)
720 HDFG: 0	13 Jan. 1977	(2)
721 HDFG: 0	27,28 July 1977	(2)
722 HDFG: 2	12,13 Jan. 1978	(2)
723 HDFG: 0	27,28,30 July 1978	(5)
724 HDFG: 0	15,16,20 Jan. 1979	(5)
725 HDFG: 1	1,2 Aug. 1980	(5)
726 HDFG: 0	14-16 Jan. 1980	(5)

Kapaa Stable Reservoir

727 HDFG: 0	1 Aug. 1975	(1)
728 HDFG: 0	15 Jan. 1976	(2)
729 HDFG: 0	4,5 Aug. 1976	(2)
730 HDFG: 0	13 Jan. 1977	(2)
731 HDFG: 0	27,28 July 1977	(2)
732 HDFG: 0	12,13 Jan. 1978	(2)
733 HDFG: 0	15,16,20 Jan. 1979	(5)
734 HDFG: 0	1,2 Aug. 1979	(5)
735 HDFG: 0	14-16 Jan. 1980	(5)

Kapaa Stream Estuary/Marsh

736 HDFG: 0	1 Aug. 1975	(2)
737 HDFG: 0	15 Jan. 1976	(2)
738 HDFG: 0	4,5 Aug. 1976	(2)
739 HDFG: 0	13 Jan. 1977	(2)
740 HDFG: 0	27,28 July 1977	(2)
741 Shallenberger: none seen or heard on 19 May or 21 July surveys but may have been present... unable to walk to the largest areas of open water	(1977)	(3)
742 HDFG: 0	12,13 Jan. 1978	(2)
743 HDFG: 0	15,16,20 Jan. 1979	(5)
744 HDFG: 0	1,2 Aug. 1979	(5)
745 HDFG: 0	14-16 Jan. 1980	(5)
746 HDFG: 0	31 July, 1 Aug. 1980	(5)
747 HDFG: 0	12 Jan. 1981	(5)

Lono Reservoir

748 HDFG: 0	1 Aug. 1975	(1)
749 HDFG: 0	15 Jan. 1976	(2)
750 HDFG: 0	4,5 Aug. 1976	(2)
751 HDFG: 0	13 Jan. 1977	(2)
752 HDFG: 0	27,28 July 1977	(2)
753 HDFG: 0	12,13 Jan. 1978	(2)
754 HDFG: 0	15,16,20 Jan. 1979	(5)
755 HDFG: 0	1,2 Aug. 1979	(5)
756 HDFG: 0	14-16 Jan. 1980	(5)

757 HDFG: 0	12 Jan. 1981	(5)
Moikeha Canal		
758 HDFG: 0	1 Aug. 1975	(1)
759 HDFG: 0	15 Jan. 1976	(2)
760 HDFG: 0	13 Jan. 1977	(2)
761 HDFG: 0	27,28 July 1977	(2)
762 HDFG: 0	12,13 Jan. 1978	(2)
763 HDFG: 0	15,16,20 Jan. 1979	(5)
764 HDFG: 0	1,2 Aug. 1979	(5)
765 HDFG: 0	14-16 Jan. 1980	(5)
766 HDFG: 0	31 July, 1 Aug. 1980	(5)
767 HDFG: 0	12 Jan. 1981	(5)
Moikeha Reservoir		
768 HDFG: 0	4,5 Aug. 1976	(2)
Wailua River/Opaekaa River/Valley		
769 specimens obtained	1840	WILC45
770 10 eggs found (Kalepa Ridge Pasture)	7 Dec. 1955	SWEG67
771 HDFG: 7	4-10 Jan. 1956	(1)
772 3 downy young seen on Wailua, above Homesteads	14 Mar. 1962	SWEG67
773 2 juveniles seen in Iole Stream, south fork Wailua River	27 Feb. 1965	SWEG67
774 6 eggs found near monkey pod plantings, Kalepa Ridge	2 Apr. 1965	SWEG67
775 4 downy young seen on lower Opaekaa Stream	25 Apr. 1966	SWEG67
776 HDFG: 3 (Rice Center)	10 Apr. 1974	(1)
777 4 seen, Christmas Count (marshy area below Falls)	29 Dec. 1974	WILE75
778 HDFG: 0 (Rice Center)	1 Aug. 1975	(2)
779 HDFG: .40 was the average number seen on 2 of 20 quarterly censuses conducted / Wailua Rice Center	1970-1975	(8)
780 HDFG: 4 (Rice Center)	15 Jan. 1976	(2)
781 HDFG: 1	4,5 Aug. 1976	(2)
782 HDFG: 3	13 Jan. 1977	(2)
783 HDFG: 3	27,28 July 1977	(2)
784 Shallenberger: no more than ten were observed on 16,18,31 May and 23 July surveys and none were sighted outside the Opaekaa taro fields	(1977)	(3)
785 HDFG: 0	12,13 Jan. 1978	(2)

786 HDFG: 0
787 HDFG: 0
788 HDFG: 0
789 HDFG: 2

27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Paradise Pacifica

790 HDFG: 0
791 HDFG: 0
792 HDFG: 0
793 HDFG: 0
794 HDFG: 0
795 HDFG: 0
796 HDFG: 0
797 HDFG: 1
798 HDFG: 0
799 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Pukaki Reservoir

800 HDFG: 0
801 HDFG: 0
802 HDFG: 0
803 HDFG: 0
804 HDFG: 0
805 HDFG: 0
806 HDFG: 0
807 HDFG: 0
808 HDFG: 0
809 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
12 Jan. 1981 (5)

Rodriques Reservoir

810 HDFG: 0
811 HDFG: 0
812 HDFG: 0
813 HDFG: 0
814 HDFG: 0
815 HDFG: 0
816 HDFG: 0
817 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)

818 HDFG: 0
819 HDFG: 0

31 July, 1 Aug. 1980 (5)
12 Jan. 1981 (5)

Sloggett (Wailua) Reservoir

820 HDFG: 0
821 HDFG: 0
822 HDFG: 0
823 HDFG: 0
824 HDFG: 0
825 HDFG: 0
826 HDFG: 0
827 HDFG: 0
828 HDFG: 0
829 HDFG: 0
830 HDFG: 0

31 Dec. 1968 (12)
1 Aug. 1975 (1)
15 Jan. 1976 (2)
4, 5 Aug. 1976 (2)
13 Jan. 1977 (2)
27, 28 July 1977 (2)
12, 13 Jan. 1978 (2)
27, 28, 30 July 1978 (5)
15, 16, 20 Jan. 1979 (5)
1, 2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Twin Reservoirs

831 HDFG: 0
832 HDFG: 0
833 HDFG: 0
834 HDFG: 0
835 HDFG: 0
836 HDFG: 0
837 HDFG: 0
838 HDFG: 0
839 HDFG: 0
840 HDFG: 0
841 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4, 5 Aug. 1976 (2)
13 Jan. 1977 (2)
27, 28 July 1977 (2)
12, 13 Jan. 1978 (2)
15, 16, 20 Jan. 1979 (5)
1, 2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
31 July, 1 Aug. 1980 (5)
12 Jan. 1981 (5)

80

Waikaea Canal

842 HDFG: 0
843 HDFG: 0
844 HDFG: 0
845 HDFG: 0
846 HDFG: 0
847 HDFG: 4
848 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4, 5 Aug. 1976 (2)
13 Jan. 1977 (2)
27, 28 July 1977 (2)
12, 13 Jan. 1978 (2)
15, 16, 20 Jan. 1979 (5)

849 HDFG: 0	1,2 Aug. 1979	(5)
850 HDFG: 0	14-16 Jan. 1980	(5)
851 HDFG: 0	31 July, 1 Aug. 1980	(5)
852 HDFG: 0	12 Jan. 1981	(5)

Wailua Golf Course

853 HDFG: 0	1 Aug. 1975	(2)
854 HDFG: 0	15 Jan. 1976	(2)
855 HDFG: 0	4,5 Aug. 1976	(2)
856 HDFG: 0	13 Jan. 1977	(2)
857 HDFG: 0	27,28 July 1977	(2)
858 HDFG: 0	12,13 Jan. 1978	(2)
859 HDFG: 0	15,16,20 Jan. 1979	(5)
860 HDFG: 0	1,2 Aug. 1979	(5)
861 HDFG: 0	14-16 Jan. 1980	(5)
862 HDFG: 0	31 July, 1 Aug 1980	(5)
863 HDFG: 0	12 Jan. 1981	(5)

Wailua Homestead Pastures

864 HDFG: average of 0.2 seen in 5 observations in January; 1 was largest number seen per survey; nesting? was not determined	1 July 1964 - 30 June 1965	(31)
865 Banko: use...to limited degree/ Wailua Pasture... along Opaekaa Stream and north side of Wailua River between Opaekaa Falls and east coast highway...estimated 85 acres (all HDFG information)	(1966)	(17)
866 HDFG: 16 seen in 12 observations	(1963-1966)	SWEG67
867 HDFG: 0	15 Jan. 1976	(2)
868 HDFG: 3	4,5 Aug. 1976	(2)
869 HDFG: 0	13 Jan. 1977	(2)
870 HDFG: 0	12,13 Jan. 1978	(2)
871 HDFG: 0	27,28,30 July 1978	(5)
872 HDFG: 0	1,2 Aug. 1979	(5)
873 HDFG: 0	14-16 Jan. 1980	(5)

Wailua Jail Swamp

874 HDFG: 0	1 Aug. 1975	(1)
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875 HDFG: 0
 876 HDFG: 0
 877 HDFG: 0
 878 HDFG: 0
 879 Shallenberger: maximum of 7 observed on surveys
 of 18 May and 21 July
 880 HDFG: 0
 881 HDFG: 0
 882 HDFG: 0
 883 HDFG: 0
 884 HDFG: 0
 885 HDFG: 0

15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 (1977) (3)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July,1 Aug. 1981 (5)
 12 Jan. 1981 (5)

HANAPEPE

Aaka Reservoir

886 HDFG: 0
 887 HDFG: 0
 888 HDFG: 0
 889 HDFG: 0
 890 HDFG: 0
 891 HDFG: 0
 892 HDFG: 0
 893 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 1,2 Aug. 1979 (5)
 14 Jan. 1981 (5)

Alexander Reservoir

894 HDFG: 0
 895 HDFG: 0
 896 HDFG: 0
 897 HDFG: 0
 898 HDFG: 0
 899 HDFG: 0
 900 HDFG: 0
 901 HDFG: 0

1 Aug. 1975 (1)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 1,2 Aug. 1979 (5)
 31 July,1 Aug. 1980 (5)
 14 Jan. 1981 (5)

Ekahi Reservoir

902 HDFG: 0

1 Aug. 1975 (1)

903 HDFG: 0
 904 HDFG: 0
 905 HDFG: 0, (permanently dried up)
 906 HDFG: 0
 907 HDFG: 0

15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 15,16,20 Jan. 1979 (5)
 12 Jan. 1981 (5)

Elima Reservoir

908 HDFG: 0
 909 HDFG: 0
 910 HDFG: 0
 911 HDFG: 0
 912 HDFG: 0
 913 HDFG: 0
 914 HDFG: 0
 915 HDFG: 0
 916 HDFG: 0
 917 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 12 Jan. 1981 (5)

Elua Reservoir

918 HDFG: 0
 919 HDFG: 0
 920 HDFG: 0
 921 HDFG: 0
 922 HDFG: 0
 923 HDFG: 0
 924 HDFG: 0
 925 HDFG: 0
 926 HDFG: 0
 927 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July, 1 Aug. 1980 (5)

Hanapepe Taro Fields

928 HDFG: 0
 929 HDFG: 0
 930 HDFG: 0
 931 HDFG: 1
 932 HDFG: 0
 933 HDFG: 0
 934 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)

935 HDFG: 0
 936 HDFG: 0
 937 HDFG: 0
 938 HDFG: 0

15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July, 1 Aug. 1980 (5)

Hanapepe Salt Pond

939 HDFG: average of 0.4 seen in 10 observations in November; 4 was largest number seen per survey; peak use for feeding and loafing was not determined

1 July 1964 - (31)
 30 June 1965

940 HDFG: 5 seen in 20 surveys

(1963-1966) SWEG67

941 USFWS: 0

13 Oct. 1968 (12)

942 USFWS: 0

16 Oct. 1968 (12)

943 USFWS: 0

31 Dec. 1968 (12)

944 HDFG: 0 seen in 20 quarterly censuses

1970-1975 (8)

945 HDFG: 0

1 Aug. 1975 (1)

946 HDFG: 0

15 Jan. 1976 (2)

946aHDFG: rarely or never used

1 July 1975 - (14)

30 June 1976

947 HDFG: 1

4,5 Aug. 1976 (2)

948 HDFG: 0

13 Jan. 1977 (2)

949 HDFG: 0

27,28 July 1977 (2)

950 Shallenberger: used in past years (unrecorded on 17 May and 20 July surveys)

(1977) (3)

951 HDFG: 0

12,13 Jan. 1978 (2)

952 HDFG: 0

27,28,30 July 1978 (5)

953 HDFG: 0

15,16,20 Jan. 1979 (5)

954 HDFG: 0

1,2 Aug. 1979 (5)

955 HDFG: 4

14-16 Jan. 1980 (5)

Hanapepe Valley

956 3 downy young seen on Manuahi Stream

30 Mar. 1963 SWEG67

957 2 downy young seen on Koula Stream

22 June 1966 SWEG67

Hukiwai Reservoir

958 HDFG: 0

1 Aug. 1975 (1)

959 HDFG: 0

15 Jan. 1976 (2)

960 HDFG: 0

4,5 Aug. 1976 (2)

961 HDFG: 0
962 HDFG: 0
963 HDFG: 0
964 HDFG: 0
965 HDFG: 0
966 HDFG: 0
967 HDFG: 0

13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13. Jan. (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Ioleau Reservoir

968 HDFG: 0
969 HDFG: 0
970 HDFG: 0
971 HDFG: 0
972 HDFG: 0
973 HDFG: 0
974 HDFG: 0
975 HDFG: 0
976 HDFG: 0
977 HDFG: 0

15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
31 July,1 Aug. 1980 (5)

Ipuolono Reservoir

978 HDFG: 0
979 HDFG: 0
980 HDFG: 0
981 HDFG: 0
982 HDFG: 0
983 HDFG: 0
984 HDFG: 0
985 HDFG: 0
986 HDFG: 0
987 HDFG: 0
988 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
12 Jan. 1981 (5)

Kaawanui Reservoir

989 HDFG: 0
990 HDFG: 0
991 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)

992 HDFG: 0	13 Jan. 1977	(2)
993 HDFG: 0	27,28 July 1977	(2)
994 HDFG: 0	12,13 Jan. 1978	(2)
995 HDFG: 0	1,2 Aug. 1979	(5)

Kalaeloa Reservoir

996 HDFG: 0	1 Aug. 1975	(1)
997 HDFG: 0	15 Jan. 1976	(2)
998 HDFG: 0	4,5 Aug. 1976	(2)
999 HDFG: 0	13 Jan. 1977	(2)
1000 HDFG: 0	27,28 July 1977	(2)
1001 HDFG: 0	12,13 Jan. 1978	(2)
1002 HDFG: 0	1,2 Aug. 1979	(5)

Kalaheo Gulches Reservoir

1003 HDFG: 0	15 Jan. 1976	(2)
1004 Shallenberger: pair flushed from an extremely turbid pond...recorded during two visits to various small ponds in the area	(1977)	(3)

Kapa Reservoir

1005 HDFG: 0	1 Aug. 1975	(1)
1006 HDFG: 0	15 Jan. 1976	(2)
1007 HDFG: 0	4,5 Aug. 1976	(2)
1008 HDFG: 0	13 Jan. 1977	(2)
1009 HDFG: 0	27,28 July 1977	(2)
1010 HDFG: 0	12,13 Jan. 1978	(2)
1011 HDFG: 0	15,16,20 Jan. 1979	(5)
1012 HDFG: 0	1,2 Aug. 1979	(5)
1013 HDFG: 0	14-16 Jan. 1980	(5)
1014 HDFG: 0	31 July, 1 Aug. 1980	(5)

Kaumakani Gulch

1015 HDFG: 64 seen in 19 surveys	(1963-1966)	SWEG67
1016 HDFG: 0	1 Aug. 1975	(1)
1017 HDFG: 0	15 Jan. 1976	(2)

1018 HDFG: 0
 1019 HDFG: 0
 1020 HDFG: 0
 1021 HDFG: 0
 1022 HDFG: 0
 1023 HDFG: 0
 1024 HDFG: 0
 1025 HDFG: 0
 1026 HDFG: 0
 1027 HDFG: 0

4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July,1 Aug. 1980 (5)
 12 Jan. 1981 (5)

Kiaha Reservoir

1028 HDFG: 0
 1029 HDFG: 0
 1030 HDFG: 0
 1031 HDFG: 0
 1032 HDFG: 0
 1033 HDFG: 0
 1034 HDFG: 0
 1035 HDFG: 0
 1036 HDFG: 0
 1037 HDFG: 0
 1038 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 12 Jan. 1981 (5)

Kuhumu Reservoir

1039 HDFG: 0

1,2 Aug. 1979 (5)

Maele Reservoir

1040 HDFG: 0
 1041 HDFG: 0
 1042 HDFG: 0
 1043 HDFG: 0
 1044 HDFG: 0
 1045 HDFG: 0
 1046 HDFG: 0
 1047 HDFG: 0
 1048 HDFG: 0

15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July,1 Aug. 1980 (5)

1049 HDFG: 0

12 Jan. 1981 (5)

Manieniula Reservoir

1050 HDFG: 0

1 Aug. 1975 (2)

1051 HDFG: 2

15 Jan. 1976 (2)

1052 HDFG: 0

4,5 Aug. 1976 (2)

1053 HDFG: 7

13 Jan. 1977 (2)

1054 HDFG: 0

27,28 July 1977 (2)

1055 HDFG: 0

12,13 Jan. 1978 (2)

1056 HDFG: 1

27,28,30 July 1978 (5)

1057 HDFG: 0

15,16,20 Jan. 1979 (5)

1058 HDFG: 0

1,2 Aug. 1979 (5)

1059 HDFG: 0

14-16 Jan. 1980 (5)

Mau Reservoir

1060 HDFG: 0

1 Aug. 1975 (1)

1061 HDFG: 0

15 Jan. 1976 (2)

1062 HDFG: 0

4,5 Aug. 1976 (2)

1063 HDFG: 0

13 Jan. 1977 (2)

1064 HDFG: 0

27,28 July 1977 (2)

1065 HDFG: 0

12,13 Jan. 1978 (2)

1066 HDFG: 0

15,16,20 Jan. 1979 (5)

1067 HDFG: 0

1,2 Aug. 1979 (5)

1068 HDFG: 0

14-16 Jan. 1980 (5)

1069 HDFG: 0

31 July, 1 Aug. 1980 (5)

Nomilo Fish Pond

1070 HDFG: 0

4,5 Aug. 1976 (2)

1071 HDFG: 0

13 Jan. 1977 (2)

1072 HDFG: 0

27,28 July 1977 (2)

1073 HDFG: 0

12,13 Jan. 1978 (2)

1074 HDFG: 0

15,16,20 Jan. 1979 (5)

1075 HDFG: 0

1,2 Aug. 1979 (5)

1076 HDFG: 0

14-16 Jan. 1980 (5)

1077 HDFG: 0

31 July, 1 Aug. 1980 (5)

1078 HDFG: 0

12 Jan. 1981 (5)

Nonopahu Reservoir

1079 HDFG: 0
1080 HDFG: 0
1081 HDFG: 0
1082 HDFG: 0
1083 HDFG: 0
1084 HDFG: 0
1085 HDFG: 0
1086 HDFG: 0
1087 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
1,2 Aug. 1979 (5)
31 July,1 Aug. 1980 (5)
14 Jan. 1981 (5)

Olokele Settling Basin

1088 HDFG: 0
1089 HDFG: 0
1090 HDFG: 0
1091 HDFG: 0
1092 HDFG: 0
1093 HDFG: 0
1094 HDFG: 0
1095 HDFG: 0
1096 HDFG: 0
1097 HDFG: 0
1098 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
31 July,1 Aug. 1980 (5)
12 Jan. 1981 (5)

Poopueo Reservoir

1099 HDFG: 0
1100 HDFG: 0
1101 HDFG: 0
1102 HDFG: 1
1103 HDFG: 0
1104 HDFG: 0
1105 HDFG: 0
1106 HDFG: 0
1107 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
31 July,1 Aug. 1980 (5)

Pulani Rservoir

1108 HDFG: 0	1 Aug. 1975	(2)
1109 HDFG: 0	15 Jan. 1976	(2)
1110 HDFG: 0	4,5 Aug. 1976	(2)
1111 HDFG: 0	13 Jan. 1977	(2)
1112 HDFG: 0	27,28 July 1977	(2)
1113 HDFG: 0	12,13 Jan. 1978	(2)
1114 HDFG: 0	27,28,30 July 1978	(5)
1115 HDFG: 0	1,2 Aug. 1979	(5)

Puu O Papai Reservoir

1116 HDFG: 0	1 Aug. 1975	(1)
1117 HDFG: 0	15 Jan. 1976	(2)
1118 HDFG: 0	4,5 Aug. 1976	(2)
1119 HDFG: 0	13 Jan. 1977	(2)
1120 HDFG: 0	27,28 July 1977	(2)
1121 HDFG: 0	12,13 Jan. 1978	(2)
1122 HDFG: 0	27,28,30 July 1978	(5)
1123 HDFG: 0	15,16,20 Jan. 1979	(5)
1124 HDFG: 0	1,2 Aug. 1979	(5)
1125 HDFG: 7	14-16 Jan. 1980	(5)
1126 HDFG: 0	12 Jan. 1981	(5)

Umi Reservoir

1127 HDFG: 0	1 Aug. 1975	(1)
1128 HDFG: 0	15 Jan. 1976	(2)
1129 HDFG: 0	4,5 Aug. 1976	(2)
1130 HDFG: 0	13 Jan. 1977	(2)
1131 HDFG: 0	27,28 July 1977	(2)
1132 HDFG: 0	12,13 Jan. 1978	(2)
1133 HDFG: 0	15,16,20 Jan. 1979	(5)
1134 HDFG: 0	1,2 Aug. 1979	(5)
1135 HDFG: 0	14-16 Jan. 1980	(5)
1136 HDFG: 0	31 July, 1 Aug. 1980	(5)
1137 HDFG: 0	12 Jan. 1981	(5)

Wahiawa Bridge Reservoir

1138 HDFG: 0	15 Jan. 1976	(2)
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1139 HDFG: 0
 1140 HDFG: 0
 1141 HDFG: 0
 1142 HDFG: 0
 1143 HDFG: 0
 1144 HDFG: 0
 1145 HDFG: 0
 1146 HDFG: 0

4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July, 1 Aug. 1980 (5)

Wahiawa Mud Flats

1147 HDFG: 77 seen in 22 observations

(1963-1966)

SWEG67

Waikai Reservoir

1148 HDFG: 0
 1149 HDFG: 0
 1150 HDFG: 0
 1151 HDFG: 0
 1152 HDFG: 0
 1153 HDFG: 0
 1154 HDFG: 0
 1155 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)

Waikoloi Reservoir

1156 HDFG: 0
 1157 HDFG: 0
 1158 HDFG: 0
 1159 HDFG: 0
 1160 HDFG: 0
 1161 HDFG: 0
 1162 HDFG: 0
 1163 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 1,2 Aug. 1979 (5)
 14 Jan. 1981 (5)

Waimea Taro Fields

1164 HDFG: 0
 1165 HDFG: 0
 1166 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)

1167 HDFG: 0
 1168 HDFG: 0
 1169 HDFG: 0
 1170 HDFG: 0
 1171 HDFG: 0
 1172 HDFG: 0

13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Waimea (village)

1173 Anderson observed ...a duck, probably Anas wyvilliana
 Sclater/ unspecified locality
 1174 gentlemen on shore were very successful in shooting,
 there being seldom a day that they did not kill half
 a dozen brace of ducks.../Wymoa (Waimea) Bay, at anchor
 1175 several flocks seen/in the low swamps...while collecting
 at Mr. Knudsen's place (near Waimea)

20-22 Jan. 1778 STRE50
 11 Mar. 1792 BELE29
 4 May (1900) BRYW01

KOLOA

Aepo Reservoir

1176 HDFG: 0
 1177 HDFG: 0
 1178 HDFG: 0
 1179 HDFG: 0
 1180 HDFG: 0
 1181 HDFG: 0
 1182 HDFG: 0
 1183 HDFG: 0
 1184 HDFG: 0
 1185 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July,1 Aug.1980 (5)

Aepoalua Reservoir

1186 HDFG: 0
 1187 HDFG: 0
 1188 HDFG: 0
 1189 HDFG: 0
 1190 HDFG: 1
 1191 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 15,16,20 Jan. 1979 (5)

1192 HDFG: 0
1193 HDFG: 0
1194 HDFG: 0

1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
31 July, 1 Aug. 1980 (5)

Aepoeha Reservoir

1195 HDFG: 0
1196 HDFG: 0
1197 HDFG: 0
1198 HDFG: 0
1199 HDFG: 0
1200 HDFG: 0
1201 HDFG: 0
1202 HDFG: 0
1203 HDFG: 0
1204 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Aepoekolu Reservoir

1205 HDFG: 0
1206 HDFG: 0
1206aHDFG: seasonal use

1207 HDFG: 0
1208 HDFG: 0
1209 HDFG: 0
1210 HDFG: 0
1211 HDFG: 0
1212 HDFG: 0
1213 HDFG: 0
1214 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
1 July 1975 - (14)
30 June 1976
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Grove Farm Settling Basin

1215 HDFG: 1
1216 HDFG: 0
1217 HDFG: 0
1218 HDFG: 0
1219 HDFG: 6
1220 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)

1221 HDFG: 3
 1222 HDFG: 0
 1223 HDFG: 13
 1224 HDFG: 3
 1225 HDFG: 0

27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 12 Jan. 1981 (5)

Grove Farm Trash Pile

1226 several downy young seen
 1227 6-8 downy young seen
 1228 1 downy young seen
 1229 several downy young seen
 1230 HDFG: average of 2.4 in 26 observations all year;
 6 was largest number seen per survey
 1231 6 downy young seen
 1232 2 juveniles seen
 1233 1 downy young seen
 1234 HDFG: average of 3.2 seen in 10 observations all year
 11 was largest number seen per survey: December-April
 was peak period of loafing, feeding, nesting use
 1235 93 seen in 36 observations
 1236 Banko: 36 counts by State biologist found total of
 93, ranging from 0-11, average 2.6 per visit...
 nesting commonly observed
 1237 HDFG: 6
 1238 HDFG: 1
 1239 HDFG: 0
 1240 HDFG: .19 average number seen in 2 of 20 quarterly
 censuses
 1241 HDFG: 0
 1242 HDFG: 0
 1243 HDFG: 3
 1244 HDFG: 0
 1245 HDFG: 0
 1246 HDFG: 0
 1247 HDFG: 0
 1248 HDFG: 0

7 Apr. 1962 SWEG67
 14 Nov. 1962 SWEG67
 4 Dec. 1962 SWEG67
 23 Sep. 1963 SWEG67
 1 July 1963 - (32)
 30 June 1964
 28 Jan. 1965 SWEG67
 1 Mar. 1965 SWEG67
 19 Mar. 1965 SWEG67
 1 July 1964 - (31)
 30 June 1965

 (1963-1966) SWEG67
 (1964-1966) (17)

 8-10 Jan. 1968 (1)
 10 Apr. 1974 (1)
 1 Aug. 1975 (1)
 1970-1975 (8)

 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Halenanahu Reservoir

1249 HDFG: 0	1 Aug. 1975	(1)
1250 HDFG: 0	15 Jan. 1976	(2)
1251 HDFG: 0	4,5 Aug. 1976	(2)
1252 HDFG: 0	13 Jan. 1977	(2)
1253 HDFG: 0	27,28 July 1977	(2)
1254 HDFG: 0	12,13 Jan. 1978	(2)
1255 HDFG: 0	15,16,20 Jan. 1979	(5)
1256 HDFG: 0	1,2 Aug. 1979	(5)
1257 HDFG: 0	14-16 Jan. 1980	(5)

Hanini Reservoir

1258 HDFG: 0	1 Aug. 1975	(2)
1259 HDFG: 0	15 Jan. 1976	(2)
1259aHDFG: rarely or never used	1 July 1975 -	(14)
	30 June 1976	
1260 HDFG: 0	4,5 Aug. 1976	(2)
1261 HDFG: 0	13 Jan. 1977	(2)
1262 HDFG: 0	27,28 July 1977	(2)
1263 HDFG: 0	12,13 Jan. 1978	(2)
1264 HDFG: 0	27,28,30 July 1978	(5)
1265 HDFG: 0	15,16,20 Jan. 1979	(5)
1266 HDFG: 0	1,2 Aug. 1979	(5)
1267 HDFG: 0	14-16 Jan. 1980	(5)

Huinawai Reservoir

1268 HDFG: 0	1 Aug. 1975	(1)
1269 HDFG: 0	15 Jan. 1976	(2)
1270 HDFG: 0	4,5 Aug. 1976	(2)
1271 HDFG: 0	13 Jan. 1977	(2)
1272 HDFG: 0	27,28 July 1977	(2)
1273 HDFG: 0	12,13 Jan. 1978	(2)
1274 HDFG: 0	15,16,20 Jan. 1979	(5)
1275 HDFG: 0	1,2 Aug. 1979	(5)
1276 HDFG: 0	14-16 Jan. 1980	(5)
1277 HDFG: 0	31 July, 1 Aug. 1980	(5)

Kaupale Reservoir

1278 HDFG: 0	1 Aug. 1975	(1)
1279 HDFG: 0	15 Jan. 1976	(2)
1280 HDFG: 0	4,5 Aug. 1976	(2)
1281 HDFG: 0	13 Jan. 1977	(2)
1282 HDFG: 0	27,28 July 1977	(2)
1283 HDFG: 0	12,13 Jan. 1978	(2)
1284 HDFG: 0	27,28,30 July 1978	(5)
1285 HDFG: 0	15,16,20 Jan. 1979	(5)
1286 HDFG: 0	1,2 Aug. 1979	(5)
1287 HDFG: 0	14-16 Jan. 1980	(5)
1288 HDFG: 0	31 July, 1 Aug. 1980	(5)

Kipu Reservoirs

1289 USFWS: 16	14 Sep. 1970	(12)
1290 HDFG: 37	8 Aug. 1973	(1)
1291 Shallenberger: According to HDFG count records for recent years, koloa are by far the most common water bird at the Kipu Reservoirs...counts indicate that, with the exception Hanalei, the Kipu reservoir #4 had the greatest frequency and degree of use by Koloa in recent years...Reservoir #2 has also supported several koloa in the past.	(1977)	(3)
1292 HDFG: 2	10 Apr. 1974	(1)
1293 HDFG: 0	1 Aug. 1975	(1)
1294 HDFG: 1.90 was the average number seen in 5 of 20 quarterly censuses conducted	1970-1975	(8)
1295 HDFG: 0	15 Jan. 1976	(2)
1296 HDFG: 0	4,5 Aug. 1976	(2)
1297 HDFG: 0	13 Jan. 1977	(2)
1298 HDFG: 0	27,28 July 1977	(2)
1299 HDFG: 0	12,13 Jan. 1978	(2)
1300 HDFG: 0	15,16,20 Jan. 1979	(5)
1301 HDFG: 0	1,2 Aug. 1979	(5)
1302 HDFG: 0	14-16 Jan. 1980	(5)

Kipu Reservoir #2

1303 HDFG: 24	9 Aug. 1973	(1)
1304 HDFG: 2	15 Nov. 1973	(1)

1305 HDFG: 3
 1306 HDFG: 0
 1307 HDFG: 3.25 was the average number seen in 8 of 20
 quarterly censuses conducted
 1308 HDFG: 0
 1309 HDFG: 1
 1310 HDFG: 0
 1311 HDFG: 0
 1312 HDFG: 0
 1313 HDFG: 3
 1314 HDFG: 3
 1315 HDFG: 0

10 Apr. 1974 (1)
 1 Aug. 1975 (1)
 1970-1975 (8)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Kipu Reservoir #3

1316 HDFG: 1
 1317 HDFG: 5
 1318 HDFG: 23
 1319 HDFG: 1.90 was the average number seen in 8 of 20
 quarterly censuses conducted
 1320 HDFG: 0
 1321 HDFG: 4
 1322 HDFG: 0
 1323 HDFG: 6
 1324 HDFG: 0
 1325 HDFG: 2
 1326 HDFG: 0
 1327 HDFG: 15
 1328 HDFG: 0

9 Aug. 1973 (1)
 15 Nov. 1973 (1)
 1 Aug. 1975 (1)
 1970-1975 (8)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Kipu Reservoir #4

1329 HDFG: 2
 1330 HDFG: 18
 1331 HDFG: 12
 1332 HDFG: 27
 1333 HDFG: 10
 1334 HDFG: 6.00 was the average number seen in 12 of 20
 quarterly censuses conducted
 1335 HDFG: 3

8-10 Jan. 1968 (1)
 8-10 Jan. 1969 (1)
 9 Aug. 1973 (1)
 15 Nov. 1973 (1)
 1 Aug. 1975 (1)
 1970-1975 (8)
 15 Jan. 1976 (2)

1335aHDFG: resident

1336 HDFG: 17
1337 HDFG: 20
1338 HDFG: 4
1339 HDFG: 0
1340 HDFG: 8
1341 HDFG: 5
1342 HDFG: 0
1343 HDFG: 0

1 July 1975 - (14)
30 June 1976
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Kipu Reservoir #5

1344 HDFG: 1

14 Jan. 1974 (1)

Kipu Road Reservoir

1345 HDFG: 0
1346 HDFG: 0
1347 HDFG: 0
1348 HDFG: 0
1349 HDFG: 0
1350 HDFG: 0
1351 HDFG: 0
1352 HDFG: 0
1353 HDFG: 0
1354 HDFG: 0
1355 HDFG: 0
1356 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
31 July,1 Aug. 1980 (5)
12 Jan. 1981 (5)

Koloakaapohu Reservoir

1357 HDFG: 0
1358 HDFG: 0
1359 HDFG: 0
1360 HDFG: 0
1361 HDFG: 2
1362 HDFG: 0
1363 HDFG: 3
1364 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)

1365 HDFG: 0
1366 HDFG: 0

1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Kumano Reservoir

1367 HDFG: 0
1368 HDFG: 0
1369 HDFG: 0
1370 HDFG: 0
1371 HDFG: 0
1372 HDFG: 0
1373 HDFG: 3
1374 HDFG: 0
1375 HDFG: 0
1376 HDFG: 0
1377 HDFG: 0
1378 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
31 July,1 Aug. 1980 (5)
12 Jan. 1981 (5)

Lawai Kai Estuary

1379 HDFG: 0
1380 HDFG: 0
1381 HDFG: 0
1382 HDFG: 0
1383 HDFG: 0
1384 HDFG: 0
1385 HDFG: 0

4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
31 July,1 Aug. 1980 (5)

Loko Reservoir

1386 HDFG: 0
1387 HDFG: 0
1388 HDFG: 0
1389 HDFG: 0
1390 HDFG: 0
1391 HDFG: 0
1392 HDFG: 0
1393 HDFG: 0
1394 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Luawai Reservoir

1395 HDFG: 0	15 Jan. 1976	(2)
1396 HDFG: 0	4,5 Aug. 1976	(2)
1397 HDFG: 0	13 Jan. 1977	(2)
1398 HDFG: 0	27,28 July 1977	(2)
1399 HDFG: 0	12,13 Jan. 1978	(2)
1400 HDFG: 0	27,28,30 July 1978	(5)
1401 HDFG: 0	15,16,20 Jan. 1979	(5)
1402 HDFG: 0	1,2 Aug. 1979	(5)
1403 HDFG: 0	14-16 Jan. 1980	(5)

Mahalepu Ponds

1404 HDFG: 2	2 Aug. 1974	(1)
1405 HDFG: 0	1 Aug. 1975	(1)
1406 HDFG: 0	15 Jan. 1976	(2)
1407 HDFG: 0	4,5 Aug. 1976	(2)
1408 HDFG: 0	13 Jan. 1977	(2)
1409 HDFG: 0	27,28 July 1977	(2)
1410 HDFG: 0	12,13 Jan. 1978	(2)
1411 HDFG: 0	15,16,20 Jan. 1979	(5)
1412 HDFG: 0	1,2 Aug. 1979	(5)
1413 HDFG: 0	14-16 Jan. 1980	(5)
1414 HDFG: 0	31 July, 1 Aug. 1980	(5)

Manuhonuhonu Reservoir

1415 HDFG: 0	1 Aug. 1975	(1)
1416 HDFG: 0	15 Jan. 1976	(2)
1417 HDFG: 0	4,5 Aug. 1976	(2)
1418 HDFG: 0	13 Jan. 1977	(2)
1419 HDFG: 0	27,28 July 1977	(2)
1420 HDFG: 0	12,13 Jan. 1978	(2)
1421 HDFG: 0	15,16,20 Jan. 1979	(5)
1422 HDFG: 0	1,2 Aug. 1979	(5)
1423 HDFG: 0	14-16 Jan. 1980	(5)
1424 HDFG: 0	31 July, 1 Aug. 1980	(5)
1425 HDFG: 0	12 Jan. 1981	(5)

Mauka Reservoir

1426 HDFG: 0
 1427 HDFG: 0
 1427aHDFG: seasonal use

 1428 HDFG: 0
 1429 HDFG: 2
 1430 HDFG: 0
 1431 HDFG: 0
 1432 HDFG: 0
 1433 HDFG: 0
 1434 HDFG: 0
 1435 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 1 July 1975 - (14)
 30 June 1976
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Omao Reservoir

1436 HDFG: 0
 1437 HDFG: 0
 1438 HDFG: 0
 1439 HDFG: 0
 1440 HDFG: 0
 1441 HDFG: 0
 1442 HDFG: 0
 1443 HDFG: 0
 1444 HDFG: 0
 1445 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Papuaa Reservoir

1446 HDFG: 0
 1447 HDFG: 0
 1448 HDFG: 0
 1449 HDFG: 0
 1450 HDFG: 0
 1451 HDFG: 0
 1452 HDFG: 0
 1453 HDFG: 0
 1454 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Papuaa Ridge Reservoir

1455 HDFG: 0	27,28,30 July 1978	(5)
1456 HDFG: 0	1,2 Aug. 1979	(5)

Pia Mill Reservoir

1457 HDFG: 0	1 Aug. 1975	(1)
1458 HDFG: 0	15 Jan. 1976	(2)
1459 HDFG: 0	4,5 Aug. 1976	(2)
1460 HDFG: 0	13 Jan. 1977	(2)
1461 HDFG: 0	27,28 July 1977	(2)
1462 HDFG: 0	12,13 Jan. 1978	(2)
1463 HDFG: 0	27,28,30 July 1978	(5)
1464 HDFG: 0	15,16,20 Jan. 1979	(5)
1465 HDFG: 0	1,2 Aug. 1979	(5)
1466 HDFG: 0	14-16 Jan. 1980	(5)

Piwai Reservoir

1467 HDFG: 2	1 Aug. 1975	(1)
1468 HDFG: 0	15 Jan. 1976	(2)
1469 HDFG: 0	4,5 Aug. 1976	(2)
1470 HDFG: 0	27,28 July 1977	(2)
1471 HDFG: 0	12,13 Jan. 1978	(2)
1472 HDFG: 0	15,16,20 Jan. 1979	(5)
1473 HDFG: 0	14-16 Jan. 1980	(5)
1474 HDFG: 0	12 Jan. 1981	(5)

Pinau Reservoir

1475 HDFG: 0	1 Aug. 1975	(1)
1476 HDFG: 0	15 Jan. 1976	(2)
1477 HDFG: 0	4,5 Aug. 1976	(2)
1478 HDFG: 0	13 Jan. 1977	(2)
1479 HDFG: 0	27,28 July 1977	(2)
1480 HDFG: 0	12,13 Jan. 1978	(2)
1481 HDFG: 0	27,28,30 July 1978	(5)
1482 HDFG: 0	15,16,20 Jan. 1979	(5)
1483 HDFG: 0	1,2 Aug. 1979	(5)
1484 HDFG: 0	14-16 Jan. 1980	(5)

1485 HDFG: 0	31 July, 1 Aug. 1980	(5)
1486 HDFG: 0	12 Jan. 1981	(5)

Poipu Area/Pond(s)

1487 1 downy young seen	21 Jan. 1958	SWEG67
1488 Fuller: pair heard calling near residence, 2 downy young found	2 Oct. 1963	SWEG67
1489 1 downy young found swimming in the pool of the Dunford home	4 May 1964	SWEG67
1490 HDFG: average of 3.6 seen in 36 surveys from October-June; 17 was largest number seen per survey; peak period of loafing, feedong, nesting use was not determined	1 July 1963 - 30 June 1964	(32)
1491 2 juveniles seen on rain pond	24 Feb. 1965	SWEG67
1492 2 juveniles seen on rain pond	9 Mar. 1965	SWEG67
1493 Fuller: observed dog pick up a duckling	5 June 1965	SWEG67
1494 HDFG: average of 24 seen in 55 surveys all year, 9 was largest number seen per survey; October-June was peak period for loafing, feeding, nesting use	1 July 1964 - 30 June 1965	(31)
1495 265 seen in 95 surveys	(1963-1966)	SWEG67
1496 Banko: total of 265 found on 95 counts by HDFG; ranged from 0-17, average 2.7 per survey	1963-1965	(17)
1497 HDFG: Poipu drained, not used by koloa	1971	(8)
1498 HDFG: 0	1 Aug. 1975	(1)
1499 HDFG: 0	15 Jan. 1976	(2)
1500 HDFG: 0	4, 5 Aug. 1976	(2)
1501 HDFG: 0	13 Jan. 1977	(2)
1502 HDFG: 0	27, 28 July 1977	(2)
1503 HDFG: 0	12, 13 Jan. 1978	(2)
1504 HDFG: 0	15, 16, 20 Jan. 1979	(5)
1505 HDFG: 0	1, 2 Aug. 1979	(5)
1506 HDFG: 0	14-16 Jan. 1980	(5)
1507 HDFG: 0	31 July, 1 Aug. 1980	(5)
1508 HDFG: 0	12 Jan. 1981	(5)

Puuhi Reservoir

1509 HDFG: 0	1 Aug. 1975	(1)
1510 HDFG: 0	15 Jan. 1976	(2)
1511 HDFG: 0	4, 5 Aug. 1976	(2)

1512 HDFG: 0	13 Jan. 1977	(2)
1513 HDFG: 0	27,28 July 1977	(2)
1514 HDFG: 0	12,13 Jan. 1978	(2)
1515 HDFG: 0	15,16,20 Jan. 1979	(5)
1516 HDFG: 0	1,2 Aug. 1979	(5)
1517 HDFG: 0	14-16 Jan. 1980	(5)

Puu O Hewa Reservoir

1518 HDFG: 0	1 Aug. 1975	(1)
1519 HDFG: 0	15 Jan. 1976	(2)
1520 HDFG: 0	4,5 Aug. 1976	(2)
1521 HDFG: 0	13 Jan. 1977	(2)
1522 HDFG: 0	27,28 July 1977	(2)
1523 HDFG: 0	12,13 Jan. 1978	(2)
1524 HDFG: 0	27,28,30 July 1978	(5)
1525 HDFG: 0	15,16,20 Jan. 1979	(5)
1526 HDFG: 0	1,2 Aug. 1979	(5)
1527 HDFG: 0	14-16 Jan. 1980	(5)
1528 HDFG: 0	31 July, 1 Aug. 1980	(5)

Waita (Koloa) Reservoir (400 acres)

1529 8...largest number seen on any reservoir	(1946-1947)	SCHC53	
1530 HDFG: 20		4-10 Jan. 1956	(1)
1530aHDFG: 32, in one flock		11 Nov. 1962	(49)
1531 5 downy young seen		16 Jan. 1963	SWEG67
1532 2 seen pover Koloa Canefields		19-22 Mar. 1964	SCHC65
1533 HDFG: average of 3.6 seen in 65 observations all year; 21 was largest number seen per survey; November-March ? was peak period of loafing, feeding, nesting use		1 July 1963 - 30 June 1964	(32)
1534 HDFG: average of 1.2 seen in 6 observations all year; 5 was largest number seen per survey; peak period of loafing, feeding or nesting use depended upon the water level maintained by the plantation		1 July 1964 - 30 June 1965	(31)
1535 Banko: use regularly...73 HDFG counts total 237, range from 0-37...1 brood seen		1963-1966	(17)
1536 237 seen in 94 surveys		(1963-1966)	SWEG67
1537 Banko: 73 HDFG counts total 237; range 0-21, usually less than 10 from December through April; 1 brood seen		1963-1966	(11)

1538 HDFG: 5	8-10 Jan. 1968	(1)
1539 USFWS: 5	14 Sep. 1970	(12)
1540 HDFG: 3	15 Nov. 1974	(1)
1541 HDFG: 0	1 Aug. 1975	(1)
1542 HDFG: .94 was the average number seen in 4 of 20 quarterly censuses conducted	1970-1975	(8)
1543 HDFG: 0	15 Jan. 1976	(2)
1543aHDFG: seasonal use	1 July 1975 - 30 June 1976	(14)
1544 HDFG: 0	4,5 Aug. 1976	(2)
1545 HDFG: 2	13 Jan. 1977	(2)
1546 HDFG: 3	27,28 July 1977	(2)
1547 Shallenberger: Twelve were counted during the (16,18) May survey but none were seen in our July trip...records show that koloa are even less common than stilt at Waita	(1977)	(3)
1548 HDFG: 7	12,13 Jan. 1978	(2)
1549 HDFG: 0	27,28,30 July 1978	(5)
1550 HDFG: 0	15,16,20 Jan. 1979	(5)
1551 HDFG: 0	1,2 Aug. 1979	(5)
1552 HDFG: 0	14-16 Jan. 1980	(5)

LIHUE

Ahukini Reservoir

1553 pair seen	4 Mar. 1961	KINB61
1554 HDFG: average of 3.4 seen in 69 observations all year; 21 was largest number seen per survey; May-August was peak period of loafing, feeding, nesting use	1 July 1963 - 30 June 1964	(32)
1555 1 downy young seen	6 July 1964	SWEG67
1556 1 observed	13 July 1964	SWEG67
1557 8 juveniles seen	9 Nov. 1964	SWEG67
1558 10 downy young seen	9 Apr. 1965	SWEG67
1559 2 downy young seen	27 May 1965	SWEG67
1560 2 juveniles seen	3 June 1965	SWEG67
1561 HDFG: average of 5.5 seen in 38 observations all year; 22 was largest number seen per survey; May-August was peak period of loafing, feeding, nesting use	1 July 1964 - 30 June 1965	(31)
1562 2 seen	5 June (1966)	DONW67
1563 HDFG: 108 counts total 425; range 0-22; average 4 per	1966	(11)

visit; occasional nesting		
1564 439 seen in 128 observations	(1963-1966)	SWEG67
1565 1 seen	5 Nov. (1967)	DONW68
1566 HDFG: 1	8-10 Jan. 1968	(1)
1567 USFWS: 2	14 Oct. 1968	(12)
1568 USFWS: 0	31 Dec. 1968	(12)
1569 USFWS: 0 seen, 2 broods noted in April	May 1970	(12)
1570 USFWS: 3	14 Sep. 1970	(12)
1571 HDFG: 1	15 Nov. 1973	(1)
1572 HDFG: 2	15 Jan. 1974	(1)
1573 HDFG: 14	10 Apr. 1974	(1)
1574 HDFG: 0	1 Aug. 1975	(1)
1575 HDFG: 3.00 was the average number seen on 9 of 20 quarterly censuses conducted	1970-1975	(8)
1576 HDFG: 0	15 Jan. 1976	(2)
1577 HDFG: 0	4,5 Aug. 1976	(2)
1578 HDFG: 0	13 Jan. 1977	(2)
1579 HDFG: 2, feeding on leeward shoreline	3 Feb. 1977	(14)
1580 HDFG: 3, flushed	28 June 1977	(14)
1581 HDFG: 0	27,28 July 1977	(2)
1582 HDFG: 0	12,13 Jan. 1978	(2)
1583 HDFG: 0	27,28,30 July 1978	(5)
1584 HDFG: 0	15,16,20 Jan. 1979	(5)
1585 HDFG: 6	1,2 Aug. 1979	(5)
1586 HDFG: 0	14-16 Jan. 1980	(5)

Aweoweonui Valley

1587 HDFG: 7	8-10 Jan. 1969	(1)
1588 HDFG: 3	13-15 Jan. 1970	(1)
1589 HDFG: 3	15 Jan. 1974	(1)
1590 HDFG: 3	2 Aug. 1974	(1)
1591 HDFG: 0	1 Aug. 1975	(1)
1592 HDFG: .69 was the average number seen in 4 of 20 quarterly censuses conducted	1970-1975	(8)
1593 HDFG: 0	15 Jan. 1976	(2)
1594 HDFG: 0	4,5 Aug. 1976	(2)
1595 HDFG: 0	13 Jan. 1977	(2)
1596 HDFG: 0	27,28 July 1977	(2)
1597 HDFG: 0	12,13 Jan. 1978	(2)

1598 HDFG: 0
1599 HDFG: 0

15,16,20 Jan. 1979 (5)
14-16 Jan. 1980 (5)

Ditch Behind Wilcox Hospital

1600 4 downy young seen
1601 2 downy young seen
1602 3 downy young seen
1603 1 downy young seen
1604 3 downy young seen
1605 3 downy young seen
1606 1 juvenile seen

31 May 1964 SWEG67
22 Nov. 1964 SWEG67
7 Mar. 1965 SWEG67
11 Apr. 1965 SWEG67
17 Apr. 1965 SWEG67
31 May 1965 SWEG67
31 May 1965 SWEG67

Haleakala Reservoir

1607 HDFG: 0
1608 HDFG: 0
1609 HDFG: 0
1610 HDFG: 0
1611 HDFG: 0
1612 HDFG: 0
1613 HDFG: 0
1614 HDFG: 0
1615 HDFG: 0
1616 HDFG: 0
1617 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
31 July,1 Aug. 1980 (5)
12 Jan. 1981 (5)

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Huleia National Wildlife Refuge

1618 HDFG: 8
1619 HDFG: 0
1620 HDFG: 3
1621 HDFG: 0
1622 HDFG: 5
1623 24 seen
1624 HDFG: 2
1625 HDFG: 0
1626 HDFG: 4
1627 HDFG: 0
1628 USFWS: 8, ave. daily use

2 Aug. 1974 (1)
1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
23 Feb. 1977 ZEIF77
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
Jan. 1980 (13)

1629 USFWS: 8, ave. daily use	Feb. 1980	(13)
1630 USFWS: 12, ave. daily use	Mar. 1980	(13)
1631 HDFG: 5	14-16 Jan. 1980	(5)
1632 USFWS: 8, ave. daily use	Jan. 1980	(13)
1633 USFWS: 10, ave. daily use	Feb. 1980	(13)
1634 USFWS: 8, ave. daily use	Mar. 1980	(13)
1635 USFWS: 8, ave. daily use	Apr. 1980	(13)
1636 USFWS: 8, ave. daily use	May 1980	(13)
1637 USFWS: 8, ave. daily use	June 1980	(13)
1638 USFWS: 4, ave. daily use	July 1980	(13)
1639 USFWS: 4, ave. daily use	Aug. 1980	(13)
1640 USFWS: 4, ave. daily use	Sep. 1980	(13)
1641 USFWS: 8, ave. daily use	Oct. 1980	(13)
1642 USFWS: 2, ave. daily use	Nov. 1980	(13)
1643 USFWS: 4, ave. daily use	Dec. 1980	(13)
1644 USFWS: 4, ave. daily use	Jan. 1981	(13)
1645 USFWS: 4, ave. daily use	Feb. 1981	(13)
1646 USFWS: 4, ave. daily use	Mar. 1981	(13)
1647 USFWS: 18, ave. daily use	Apr. 1981	(13)
1648 USFWS: 17, ave. daily use	May 1981	(13)
1649 USFWS: 4, ave. daily use	June 1981	(13)
1650 USFWS: 4, ave. daily use	July 1981	(13)
1651 USFWS: 2, ave. daily use	Aug. 1981	(13)
1652 USFWS: 2, ave. daily use	Sep. 1981	(13)
1653 USFWS: 7, ave. daily use	16 Dec. 1981 -	(13)
	15 Jan. 1982	
1654 USFWS: 20, ave. daily use	16 Feb.-31 Mar. 1982	(13)
1655 USFWS: 15, ave. daily use	Apr. 1982	(13)
1656 USFWS: 0, ave. daily use	May 1982	(13)
1657 USFWS: 12, ave. daily use	June 1982	(13)

Huleia Valley (Huleia NWR, Menehune Pond, etc.)

1658 Shallenberger: 1 counted at Menehune Fishpond in May and another flushed from the Papakolea Stream drainage 19 July	(1977)	(3)
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Menehune Fish Pond

1659 HDFG: 2	8-10 Jan. 1968	(1)
1660 HDFG: 5	8-10 Jan. 1969	(1)

1661 HDFG: 1
 1662 HDFG: 10
 1663 HDFG: 3
 1664 HDFG: 0
 1665 HDFG: 1.75 was the average number seen in 6 of 20
 quarterly censuses
 1666 HDFG: 0
 1667 HDFG: 0
 1668 HDFG: 0
 1669 HDFG: 20 flushed from bullrushes
 1670 HDFG: 2
 1671 HDFG: 0
 1672 HDFG: 0
 1673 HDFG: 0
 1674 HDFG: 0
 1675 HDFG: 0

15 Nov. 1973 (1)
 10 Apr. 1974 (1)
 2 Aug. 1974 (1)
 1 Aug. 1975 (1)
 1970-1975 (8)

 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 2 July 1977 (14)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July,1 Aug. 1980 (5)

Nawiliwili Lighthouse Area

1676 6 downy young seen

10 Dec. 1964 SWEG67

Kauai Surf Glof Course Ponds

1677 HDFG: 0
 1678 HDFG: 0
 1679 HDFG: 0
 1680 HDFG: 0
 1681 HDFG: 0
 1682 HDFG: 0
 1683 HDFG: 0
 1684 HDFG: 0
 1685 HDFG: 0
 1686 HDFG: 0

1 Aug. 1975 (1)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)
 31 July,1 Aug. 1980 (5)

Kauai Surf (Hotel) Ponds

1687 HDFG: 0
 1688 HDFG: 0
 1689 HDFG: 4
 1690 HDFG: 0

1 Aug. 1975 (2)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)

1691 HDFG: 0
 1692 HDFG: 0
 1693 HDFG: 0
 1694 HDFG: 0
 1695 HDFG: 0

27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Lihue Plantation Settling Basin

1696 3 downmy young seen
 1697 HDFG: average of 8.8 seen in 6 surveys all year;
 23 was largest number seen per survey; peak use not
 determined
 1698 3 seen
 1699 HDFG: 391 seen in 33 surveys
 1700 Banko: 12 counts total 80; range 1-23; ave. 6.7
 per visit (HDFG)
 1701 total of 31 lost to botulism

 1702 9 counted
 1703 8 counted
 1704 2-3 pairs
 1705 HDFG: 2
 1706 HDFG: 1
 1707 USFWS: 0
 1708 HDFG: 11
 1709 USFWS: 3
 1710 HDFG: 24
 1711 USFWS: 34
 1712 HDFG: 2
 1713 HDFG: 10
 1714 HDFG: 0
 1715 HDFG: 2.90 was the average number seen on 6 of 20
 quarterly censuses
 1716 HDFG: 0
 1717 HDFG: 1
 1718 HDFG: 2
 1719 HDFG: 0
 1720 HDFG: 0
 1721 HDFG: 0
 1722 HDFG: 0

22 Apr. 1965 SWEG67
 1 July 1964 - (31)
 30 June 1965

 6 Aug. 1965 DONW65
 (1963-1966) SWEG67
 1964-1966 (11)

 15 Dec. 1966 - SWEG67
 23 Jan. 1967
 25 Jan. 1967 SWEG67
 27 Jan. 1967 SWEG67
 4 Jan. 1968 ORER68
 8-10 Jan. 1968 (1)
 24 July 1968 (1)
 31 Dec. 1968 (12)
 13-15 Jan. 1970 (1)
 8 May 1970 (12)
 7 Aug. 1970 (22)
 14 Sep. 1970 (12)
 15 Nov. 1973 (1)
 10 Apr. 1974 (1)
 1 Aug. 1975 (1)
 1970-1975 (8)

 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)

1723 HDFG: 0
1724 HDFG: 0

1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Niumalu Flats

1725 Shallenberger: no koloa seen on surveys 19 May and 20 July but resident farmers report this species to visit this area regularly...nesting on slopes bordering Puali Stream on several occasions during past 21 years

(1977) (3)

1726 HDFG: 0
1727 HDFG: 0

12,13 Jan. 1978 (2)
31 July, 1 Aug. 1980 (5)

Puhi Canefield

1728 3 downy young seen
1729 1 downy young seen
1730 2 downy young seen

25 Jan. 1965 SWEG67
23 Mar. 1965 SWEG67
6 Apr. 1965 SWEG67

Waikaia Reservoir

1731 HDFG: 0
1732 HDFG: 0
1733 HDFG: 0
1734 HDFG: 0
1735 HDFG: 0
1736 HDFG: 0
1737 HDFG: 0
1738 HDFG: 0

1 Aug. 1975 (1)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
1,2 Aug. 1979 (5)
31 July, 1 Aug. 1980 (5)

Island of Ni'ihau

ISLANDWIDE INFERENCE

1739 a few seen on 8 or 9 lagoons
1740 HDFG: thought to be extinct or extirpated
1741 HDFG: 3
1742 HDFG: 7
1743 One of the more unusual observations this year was the occurrence of 56 koloa on Ni'ihau during the summer census.

2 Nov. 1939 MUNG40
(1969) (7)
7 Aug. 1970 (22)
5 Aug. 1974 (1)
1 July 1975- (2)
30 June 1976

Never before have this many koloa been reported on Ni'ihau. The winter population was only 16 on that island, indicating the likelihood of there being movements between Ni'ihau and Kaua'i

1744 HDFG: 56	1 Aug. 1975	(2)
1745 HDFG: 16	15 Jan. 1976	(2)
1746 HDFG: 16	4,5 Aug. 1976	(2)
1747 HDFG: 6	13 Jan. 1977	(2)
1748 HDFG: water levels were extremely low during summer and winter censuses...birds were concentrated at only a handful of habitats	1 July 1976 -	(2)
1749 HDFG: 1	27,28 July 1977	(2)
1750 HDFG: 45	12,13 Jan. 1978	(2)
1751 HDFG: large concentration observed during the winter survey...sighting of only 1 during summer survey is indicative of considerable movement between Ni'ihau and Kaua'i	1 July 1977 - 30 June 1978	(2)
1752 HDFG: 0	15,16,20 Jan. 1979	(5)
1753 HDFG: 9	1,2 Aug. 1979	(5)
1754 HDFG: 0	14-16 Jan. 1980	(5)
1755 HDFG: 3	31 July, 1 Aug. 1980	(5)
1756 HDFG: 0	12-14 Jan. 1981	(5)

UNDESIGNATED LOCALITY

1757 Palmer observed large flocks, sometimes probably not less than a hundred together	July 1893	ROTW00
1758 Banko: Palmer collected 10 specimens	27 July 1893	(10)
1759 Robinson reported occasional occurrence	(1946-1947)	SCHC53
1760 HDFG: 35 on Reservoir east of village	1 Aug. 1975	(1)
1761 HDFG: 16 on broad tidal ponds and ditches	1 Aug. 1975	(1)
1762 HDFG: 5 on beach ponds on north shore	1 Aug. 1975	(1)

QUADRANGLE/LOCALITY

Haao Reservoir

1763 HDFG: 4	4,5 Aug. 1976	(2)
1764 HDFG: 6	13 Jan. 1977	(2)

Halalii Lake and Ditches

1765 only 1 sight record
1766 HDFG: 4
1767 HDFG: 0
1768 HDFG: 0
1769 HDFG: 13
1770 HDFG: 3
1771 HDFG: 0
1772 HDFG: 3
1773 HDFG: 0

12-16 Aug. 1947 FISH51
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Halulu Lake and Ditches

1774 HDFG: 0
1775 HDFG: 0
1776 HDFG: 0
1777 HDFG: 0
1778 HDFG: 0
1779 HDFG: 0
1780 HDFG: 0
1781 HDFG: 0

4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Kaalialinui Valley

1782 HDFG: 0

1,2 Aug. 1979 (5)

Kaumuhonu Reservoir

1783 HDFG: 0

14-16 Jan. 1980 (5)

Kaununui Reservoir

1784 HDFG: 2

12,13 Jan. 1978 (2)

Keanauhi Reservoir

1785 HDFG: 8
1786 HDFG: 1
1787 HDFG: 0

4,5 Aug. 1976 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)

1788 HDFG: 0	15,16,20 Jan. 1979	(5)
1789 HDFG: 0	14-16 Jan. 1980	(5)
Kiekie Pond(s)		
1790 HDFG: 0	13 Jan. 1977	(2)
1791 HDFG: 0	27,28 July 1977	(2)
1792 HDFG: 0	27,28,30 July 1978	(5)
1793 HDFG: 0	15,16,20 Jan. 1979	(5)
1794 HDFG: 0	14-16 Jan. 1980	(5)
Nonopapa Lake		
1795 HDFG: 0	13 Jan. 1977	(2)
1796 HDFG: 0	27,28 July 1977	(2)
1797 HDFG: 0	12,13 Jan. 1978	(2)
1798 HDFG: 0	27,28,30 July 1978	(5)
1799 HDFG: 0	15,16,20 Jan. 1979	(5)
1800 HDFG: 0	1,2 Aug. 1979	(5)
1801 HDFG: 0	14-16 Jan. 1980	(5)
Palikoe Pond		
1802 HDFG: 0	12,13 Jan. 1978	(2)
Pohueloa Reservoir		
1803 HDFG: 0	27,28 July 1977	(2)
1804 HDFG: 20	12,13 Jan. 1978	(5)
1805 HDFG: 6	1,2 Aug. 1979	(5)
1806 HDFG: 0	31 July, 1 Aug. 1980	(5)
Puu Alala Pond(s)		
1807 HDFG: 0	12,13 Jan. 1978	(2)
1808 HDFG: 0	15,16,20 Jan. 1979	(5)
1809 HDFG: 0	14-16 Jan. 1980	(5)
1810 HDFG: 0	31 July, 1 Aug. 1980	(5)

Puuwai Pond(s)

1811 HDFG: 10
1812 HDFG: 0

12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)

Island of O'ahu

ISLANDWIDE INFERENCE

1813 native wild duck being the most numerous...of three or four varieties...becoming scarce.. / haunts...daily being more and more circumscribed by the progressive absorption of our marshes and taro-lands for the purpose of rice culture (and)...being driven away by the presence of laborers in the fields, and the incessant discharges of fire-arms for the purpose of scaring away granivorous birds from the rice...especially is this so of Waikiki, Manoa, Kalihi and Ewa, near town...

(1881)

ANON67b

1814 fairly common / among the tule swamps and ponds near the coast

12 Nov. 1889-
20 Mar. 1900
(1946,1947)

SEAA00

1815 less than 30 estimated...population still declining indicated by J. D. Smith (HDFG)

SCHC53

1816 HDFG: 0

15 Jan. 1964

(1)

1817 HDFG: 0

13-15 Jan. 1965

(1)

1818 HDFG: 1

Jan. 1966

(2)

1819 HDFG: thought to be extirpated on O'ahu

(1969)

(7)

1820 occurs in small numbers

1972

HAWS72

1821 HDFG: 4

Aug. 1973

(2)

1822 HDFG: no investigations conducted

1 July 1973 -

(21)

30 June 1974

Aug. 1974

(2)

Jan. 1975

(2)

1825 HDFG: sighted in 3 areas...planned bi-monthly censuses not completed

1 July 1974 -

(21)

30 June 1975

1 Aug. 1975

(2)

15 Jan. 1976

(2)

Jan. 1977

(2)

1829 HDFG: increase in sightings during 4-5 August 1976 survey is attributable to the release project

1 July 1976 -

(2)

30 June 1977

27,28 July 1977

(2)

12,13 Jan. 1978

(2)

1830 HDFG: 20

1831 HDFG: 58

1832 HDFG: continue to be seen in greater numbers due to annual releases and reproduction in the wild	1 July 1977 -	(2)
1833 HDFG: 46	30 June 1978	
1834 HDFG: 33	15,16,20 Jan. 1979	(5)
1835 HDFG: 31	1,2 Aug. 1979	(5)
1836 HDFG: 24	14-16 Jan. 1980	(5)
1837 HDFG: 32	31 July, 1 Aug. 1980	(5)
	12-14 Jan. 1981	(5)

UNSPECIFIED LOCALITY

1838 Banko: Behn collected 2 specimens	22 Oct. 1846	(10)
1839 Banko: Wilson collected 1 specimen (Koolau Mtns.)	1888	(10)
1840 Banko: Wilson collected 1 specimen (Helemano area)	1888	(10)
1841 Banko: Palmer collected 5 specimens	Apr. - June 1893	(10)
1842 Alona: saw a duck alight and 3 ducklings swim out from it...a few days afterward she had 7 young ones	(1944)	MUNG44
1843 Fleming: saw a duck fly to the swamp (?Kawainui) carrying a young one between its feet	(1944)	MUNG44

MULTIQUADRANGLE/MULTILOCALITY

1844 the sportsman may now look in vain for a brace, where a few years since he might have found them by the dozen / Wakiki, Manoa, Kalihi, and Ewa, near town	(1881)	ANON81
1845 two censused, Christmas Count (from free-flying flock, Honolulu Zoo) / Diamond Head Crater to Paiko Lagoon	29 Dec. 1968	ANON69
1846 1-4 reported occasionally / Kaneohe MCAS, Kawainui Marsh, Kaelepulu Canal...all near Kailua	fall of 1977	PYLR78
1847 9 censused, Christmas Count / Kaneohe Bay Drive, Kaneohe MCAS, Moku Manu (Sector 9)	18 Dec. 1977	PYLR78
1848 7 censused, Christmas Count / Waimanalo, Bellows Filed, Kaelepulu, Maunawili (Sector 7)	18 Dec. 1977	PYLR78
1849 Shallenberger: Our survey was complicated by difficulty in obtaining independent access, so we rely heavily upon the historical data in evaluating the different sites... Koloa appear only recently on count records in the Pearl Harbor Wetlands / Pearl Harbor Wetlands (incl. Pearl Harbor NWR)	1977	(3)
1850 2 censused, Christmas Count / Kaneohe Bay Drive; Kaneohe MCAS; Kawainui Marsh, Quarry Road, Dump	17 Dec. 1978	PYLR79

1851	6 censused, Christmas Count / Waimanalo, Bellows AFS, Kaelepulu Pond	17 Dec. 1978	PYLR79
1852	12 censused, Christmas Count / Lanikai; Kawainui dike; Hamakua Canal	16 Dec. 1979	PYLR80
1853	2 censused, Christmas Count / Waimanalo; Bellows AFS; Kaelepulu; Maunawili	16 Dec. 1979	PYLR80
1854	13 censused, Christmas Count / Waipio Peninsula; Honouliuli, Pearl Harbor NWR	(Dec. 1979)	STEM81
1855	7 censused, Christmas Count / Waipio Peninsula; Pearl Harbor NWR	(Dec. 1980)	STEM81
1856	4 censused, Christmas Count / Kahaluu; Heeia; Kam Highway; Old Pali Road	(Dec.)1980	PYLR81
1857	3 censused, Christmas Count / Kaneohe Bay Drive; Kaneohe MCAS	(Dec.)1980	PYLR81
1858	4 censused, Christmas Count / Waimanalo; Bellows AFS; Kaelepulu Pond; Maunawili	(Dec.)1980	PYLR81
1859	8 censused, Christmas Count / Lanikai; Kawainui dike Hamakua Drive; Kawainui Marsh; Quarry Road; Kapaa Landfill	(Dec.)1980	PYLR81

Pearl Harbor National Wildlife Refuge
[West Loch (Honouliuli) and Pearl City (Waiawa) Units]

1860	USFWS: 0 ave. daily use	Oct. 1979	(13)
1861	USFWS: 0 ave. daily use	Nov. 1979	(13)
1862	USFWS: 0 ave. daily use	Dec. 1979	(13)
1863	USFWS: 0 ave. daily use	Jan. 1980	(13)
1864	USFWS: 0 ave. daily use	Feb. 1980	(13)
1865	USFWS: 0 ave. daily use	Mar. 1980	(13)
1866	USFWS: 0 (.1) ave. daily use	Apr. 1980	(13)
1867	USFWS: 0 ave. daily use	May 1980	(13)
1868	USFWS: 0 ave. daily use	June 1980	(13)
1869	USFWS: 0 ave. daily use	July 1980	(13)
1870	USFWS: 0 ave. daily use	Aug. 1980	(13)
1871	USFWS: 0 ave. daily use	Sep. 1980	(13)

QUADRANGLE/LOCALITY

Ko'olau District (Part 1)

WAIMEA

Waialae Reservoir

1872 HDFG: 0	15 Jan. 1976	(2)
1873 HDFG: 0	13 Jan. 1977	(2)
1874 HDFG: 0	1,2 Aug. 1979	(5)
1875 HDFG: 4	16 Jan. 1980	(33)
1876 HDFG: 6	17 Jan. 1980	(33)

Waimea Falls Arboretum

1877 HDFG: 10 drakes and 10 ducks (captive-raised and banded at Pohakuloa) were dyed yellow and released after 35 days in holding pen	23 Feb. 1977	(36)
1878 HDFG: 1 yellow-dyed duck with 4 ducklings sighted	17 Apr. 1977	(36)
1879 HDFG: 1 yellow-dyed duck with 4 ducklings recorded	15 May 1977	(36)
1880 HDFG: 1 yellow-dyed duck with 3 ducklings sighted	27 June 1977	(36)
1881 HDFG: 26 (captive-raised and banded at Pohakuloa) released	30 Nov. 1977	(34)
1882 HDFG: 20	12,13 Jan. 1978	(2)
1883 HDFG: 4	28 July 1978	(34)
1884 HDFG: 3	15 Jan. 1979	(34)
1885 HDFG: 21 drakes and 25 ducks (captive-raised at Pohakuloa) were banded, dyed yellow and released after 40 days in holding pen	19 Apr. 1979	(34)
1886 HDFG: 4 green-dyed individuals (released 17 April 1979 at Kawainui) were sighted	2 Nov. 1979	(33)
1887 HDFG: 1 duck with 5 ducklings sighted	7 Nov. 1979	(33)
1888 HDFG: 1 nest with broken eggshells and 1 nest with 1 old egg found	17 Nov. 1979	(33)
1889 HDFG: duck with 2 half-grown young sighted	4 Dec. 1979	(33)
1890 HDFG: 18	14 Jan. 1980	(33)
1891 HDFG: 11	11 June 1980	(33)
1892 HDFG: duck with 2 ducklings sighted	26 June 1980	(33)

Waimea Falls Park/Estuary

1893 HDFG: 11 from San Antonio (Texas) Zoo released by Honolulu Zoo	28 May 1974	(35)
1894 HDFG: 0	13 Jan. 1977	(2)
1895 HDFG: 5	27,28 July 1977	(2)
1896 HDFG: 4	27,28,30 July 1978	(5)
1897 HDFG: 3	15,16,20 Jan. 1979	(5)
1898 HDFG: 23	1,2 Aug. 1979	(5)
1899 HDFG: 18	14-16 Jan. 1980	(5)
1900 HDFG: duck with 4 ducklings	23 Jan. 1980	(33)
1901 HDFG: 2 pairs sighted, 1 without leg band	13 June 1980	(33)

Waimea River Wetlands

1902 Shallenberger: 11 released by HDFG:...whether or not these captive (raised) birds are breeding in the area has not been determined	May 1974	(3)
1903 Shallenberger: 20 released by HDFG:...whether or not these captive (raised) birds are breeding in the area has not been determined	Feb. 1977	(3)

Waianae District

KAENA

Kapaluaa Bridge-Stream

1904 HDFG: 0	4,5 Aug. 1976	(2)
1905 HDFG: 0	13 Jan. 1977	(2)
1906 HDFG: 0	12,13 Jan. 1978	(2)
1907 HDFG: 0	1,2 Aug. 1979	(5)
1908 HDFG: 0	31 July, 1 Aug. 1980	(5)

Mokuleia - Makaleha Stream - Dillingham Air Field/Pond

1909 pair seen morning and evenings on a little stream in Pukaloa Valley (?Makaleha Stream)...near cabin, windward Waianae Mtns., lower edge of forest within few hours climb of Mt. Kaala, 4,030 ft.	21 Jan.-9 Mar. 1901	BRYW05
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1910 HDFG: 0	1 Aug. 1975	(2)
1911 HDFG: 0	15 Jan. 1976	(2)
1912 HDFG: 0	4,5 Aug. 1976	(2)
1913 HDFG: 0	13 Jan. 1977	(2)
1914 HDFG: 0	27,28 July 1977	(2)
1915 HDFG: 0	12,13 Jan. 1978	(2)
1916 HDFG: 2	15,16,20 Jan. 1979	(5)
1917 HDFG: 0	1,2 Aug. 1979	(5)
1918 HDFG: 0	14-16 Jan. 1980	(5)

Mokuleia Quarry

1919 HDFG: to be included in future censuses due to recent waterbird sightings	begin July 1981	(5)
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HALEIWA

Haleiwa Lotus Farm-Ponds-Wetlands-Elementary School

1920 HDFG: 3	15 Jan. 1976	(2)
1921 HDFG: 0	12,13 Jan. 1978	(2)
1922 HDFG: 0	27,28,30 July 1978	(5)
1923 HDFG: 2 green-dyed individuals sighted (released 17 April 1979 at Kawainui)	5 Nov. 1979	(33)
1924 HDFG: 0	15,16,20 Jan. 1979	(5)
1925 HDFG: 0	1,2 Aug. 1979	(5)
1926 HDFG: 0	14-16 Jan. 1980	(5)

Helemano Reservoir

1927 HDFG: 0	12,13 Jan. 1978	(2)
1928 HDFG: 0	15,16,20 Jan. 1979	(5)
1929 HDFG: 0	1,2 Aug. 1979	(5)
1930 HDFG: 0	31 July, 1 Aug. 1980	(5)
1931 HDFG: to be excluded from future censuses due to non-use	begin July 1981	(5)

Kaiaka Bay

1932 HDFG: 0	4,5 Aug. 1976	(2)
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Kawailoa (Meadow Gold)

1933 HDFG: 0

4,5 Aug. 1976 (2)

Tsuruda Hasu Fields

1934 HDFG: 0

1,2 Aug. 1979 (5)

Ukoa-Pond-Mash

1935 HDFG: 0

1 Aug. 1975 (2)

1936 HDFG: 0

15 Jan. 1976 (2)

1937 HDFG: 0

4,5 Aug. 1976 (2)

1938 HDFG: 0

13 Jan. 1977 (2)

1939 HDFG: 0

27,28 July 1977 (2)

1940 HDFG: 0

12,13 Jan. 1978 (2)

1941 HDFG: 0

27,28,30 July 1978 (5)

1942 HDFG: 0

15,16,20 Jan. 1979 (5)

1943 HDFG: 0

1,2 Aug. 1979 (5)

1944 HDFG: 0

14-16 Jan. 1980 (5)

Waialua

1945 specimens obtained

(1887-1888) WILS93

1946 Perkins: common...large bags shot...

winter 1892-1893 (15)

Waialua Settling Basins

1947 HDFG: 0

15,16,20 Jan. 1979 (5)

1948 HDFG: 0

1,2 Aug. 1979 (5)

1949 HDFG: 0

14-16 Jan. 1980 (5)

1950 HDFG: 0

31 July, 1 Aug. 1980 (5)

WAIANAE

Makaha-Ponds-Sewage

1951 HDFG: 0

1 Aug. 1976 (2)

1952 HDFG: 0

15 Jan. 1976 (2)

1953 HDFG: 0

4,5 Aug. 1976 (2)

1954 HDFG: 0	13 Jan. 1977	(2)
1955 HDFG: 0	27,28 July 1977	(2)
1956 HDFG: 0	12,13 Jan. 1978	(2)
 Waianae Dump		
1957 HDFG: 0	15 Jan. 1976	(2)
1958 HDFG: 0	13 Jan. 1977	(2)
 Yamaguchi Farm		
1959 HDFG: 0	4,5 Aug. 1976	(2)
1960 HDFG: 0	13 Jan. 1977	(2)
1961 HDFG: 0	27,28 July 1977	(2)
 SCHOFIELD BARRACKS		
 Lualualei Naval Ammunition Depot		
1962 HDFG: released 4 ducklings captured at Black Point	16 Aug. 1972	(35)
1963 HDFG: 0	1 Aug. 1975	(2)
1964 HDFG: 0	15 Jan. 1976	(2)
1965 HDFG: 0	4,5 Aug. 1976	(2)
1966 HDFG: 0	13 Jan. 1977	(2)
1967 HDFG: 0	27,28 July 1977	(2)
1968 HDFG: 0	12,13 Jan. 1978	(2)
1969 HDFG: 0	27,28,30 July 1978	(5)
1970 HDFG: 0	15,16,20 Jan. 1979	(5)
1971 HDFG: 0	1,2 Aug. 1979	(5)
1972 HDFG: 1	14-16 Jan. 1980	(5)
 EWA		
 Campbell Industrial Park		
1973 HDFG: 0	1 Aug. 1975	(1)
1974 HDFG: 0	15 Jan. 1976	(2)
1975 HDFG: 0	4,5 Aug. 1976	(2)
1976 HDFG: 0	13 Jan. 1977	(2)
1977 HDFG: 0	27,28 July 1977	(2)

1978 HDFG: 0
 1979 HDFG: 0
 1980 HDFG: 0
 1981 HDFG: 0
 1982 HDFG: 0

12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Ko'olau District (Part 2.)

KAHUKU

Kahuku Ranch

1983 specimen taken out of camp on the outskirts of the forest 16 Mar. 1893
 in a deep ravine above Kahuku Ranch

ROTW00

James Campbell National Wildlife Refuge (Kii and Punamano Units)

1984 USFWS: 0 ave. daily use	Oct. 1979	(13)
1985 USFWS: 0 ave. daily use	Nov. 1979	(13)
1986 USFWS: 0 ave. daily use	Dec. 1979	(13)
1987 USFWS: .1 ave. daily use	Jan. 1980	(13)
1988 USFWS: .1 ave. daily use	Feb. 1980	(13)
1989 USFWS: .1 ave. daily use	Mar. 1980	(13)
1990 USFWS: .1 ave. daily use	Apr. 1980	(13)
1991 USFWS: 10 ave. daily use	May 1980	(13)
1992 USFWS: 0 ave. daily use	June 1980	(13)
1993 USFWS: 0 ave. daily use	July 1980	(13)
1994 USFWS: 0 ave. daily use	Aug. 1980	(13)
1995 USFWS: 0 ave. daily use	Sep. 1980	(13)
1996 USFWS: 0 ave. daily use	Oct. 1980	(13)
1997 USFWS: 0 ave. daily use	Nov. 1980	(13)
1998 USFWS: 0 ave. daily use	Dec. 1980	(13)
1999 USFWS: 0 ave. daily use	Jan. 1981	(13)
2000 USFWS: .1 ave. daily use	Feb. 1981	(13)
2001 USFWS: 0 ave. daily use	Mar. 1981	(13)
2002 USFWS: 0 ave. daily use	Apr. 1981	(13)
2003 USFWS: 0 ave. daily use	May 1981	(13)
2004 USFWS: 0 ave. daily use	June 1981	(13)
2005 USFWS: 0 ave. daily use	July 1981	(13)
2006 USFWS: .1 ave. daily use	Aug. 1981	(13)

2007 2 seen
2008 USFWS: .1 ave. daily use

15 Sep. 1981
Sep. 1981

PYLR81
(13)

Kahuku (Kii) Pond(s) (now in James Campbell National Wildlife Refuge)

2009 HDFG: 0	1 Aug. 1975	(2)
2010 HDFG: 0	15 Jan. 1976	(2)
2011 HDFG: 0	4,5 Aug. 1976	(2)
2012 HDFG: 0	13 Jan. 1977	(2)
2013 USFWS: 0	Jan. 1977	(13)
2014 USFWS: 0	June 1977	(13)
2015 HDFG: 0	27,28 July	(2)
2016 USFWS: 0	July 1977	(13)
2017 USFWS: 0	Aug. 1977	(13)
2018 USFWS: 0	Sep. 1977	(13)
2019 USFWS: 0	Oct. 1977	(13)
2020 USFWS: 0	Nov. 1977	(13)
2021 USFWS: 0	Dec. 1977	(13)
2022 USFWS: 7 (koloa?)	12 Jan. 1978	(13)
2023 USFWS: 0	Feb. 1978	(13)
2024 USFWS: 0	Mar. 1978	(13)
2025 HDFG: 0	27,28,30 July	(5)
2026 USFWS: 2	11 Apr. 1978	(13)
2027 USFWS: 12	25 Apr. 1978	(13)
2028 USFWS: 0	Aug. 1978	(13)
2029 USFWS: 8	6 Sep. 1978	(13)
2030 USFWS: present	10 Sep. 1978	(13)
2031 USFWS: 0	Oct. 1978	(13)
2032 USFWS: 0	Nov. 1978	(13)
2033 USFWS: 0	Dec. 1978	(13)
2034 USFWS: 0	15 Jan. 1979	(13)
2035 USFWS: 0	Jan. 1979	(13)
2036 USFWS: 0	1 Feb. 1979	(13)
2037 USFWS: 2	7 Mar. 1979	(13)
2038 USFWS: 2	18 Mar. 1979	(13)
2039 USFWS: 2	20 Mar. 1979	(13)
2040 USFWS: 2	22 Mar. 1979	(13)
2041 USFWS: 3	26 Mar. 1979	(13)
2042 USFWS: 2	31 Mar. 1979	(13)
2043 USFWS: 4	13 Apr. 1979	(13)

2044 USFWS: 0	May 1979	(13)
2045 HDFG: 2	1,2 Aug. 1979	(5)
2046 USFWS: 12 (koloa?)	6 Sep. 1979	(13)
2047 USFWS: 2 (koloa)	11 Sep. 1979	(13)
2048 2 seen	14 Oct. 1979	CONS80
2049 USFWS: 0	Oct. 1979	(13)
2050 USFWS: 0	Nov. 1979	(13)
2051 2 present	8 Dec. 1979	PYLR81
2052 HDFG: 0	14,15,16 Jan. 1980	(5)
2053 5 seen	11 Jan. 1981	HARK81
2054 USFWS: 4, ave. daily use	15 Nov.-15 Dec.1981	(13)
2055 USFWS: 17, ave. daily use	16 Dec.1981 -	(13)
	15 Jan. 1982	
2056 USFWS: 4, ave. daily use	16 Jan.-15 Feb.1982	(13)
2057 USFWS: not censused	16 Feb.-31 Mar.1982	(13)
2058 USFWS: 20 ave. daily use	Apr. 1982	(13)
2059 USFWS: 20 adult + 5 young, ave. daily use	May 1982	(13)
2060 USFWS: 4, ave. daily use	June 1982	(13)

Kahuku (Punamano) Pond(s) (now in James Campbell National Wildlife Refuge)

2061 HDFG: 0	1 Aug. 1975	(2)
2062 USFWS: 0	Nov. 1975	(13)
2063 HDFG: 0	15 Jan. 1976	(2)
2064 USFWS: 0	Jan.1976	(13)
2065 HDFG: 0	4,5 Aug. 1976	(2)
2066 USFWS: 0	Jan. 1977	(13)
2067 USFWS: 0	June 1977	(13)
2068 USFWS: 0	July 1977	(13)
2069 HDFG: 0	13 Jan. 1977	(2)
2070 HDFG: 0	27,28 July 1977	(2)
2071 USFWS: 0	Aug. 1977	(13)
2072 USFWS: 0	Nov. 1977	(13)
2073 HDFG: 0	12,13 Jan. 1978	(2)
2074 USFWS: 0	Jan. 1978	(13)
2075 USFWS: 0	Mar. 1978	(13)
2076 USFWS: 12	11 Apr. 1978	(13)
2077 HDFG: 2	27,28,30 July 1978	(5)
2078 USFWS: 0	Aug. 1978	(13)

2079 USFWS: 0	Oct. 1978	(13)
2080 USFWS: 0	Nov. 1978	(13)
2081 USFWS: 0	Dec. 1978	(13)
2082 HDFG: 0	15,16,20 Jan. 1979	(5)
2083 USFWS: 0	Jan. 1979	(13)
2084 USFWS: 0	Feb. 1979	(13)
2085 USFWS: 0	Mar. 1979	(13)
2086 HDFG: 0	1,2 Aug. 1979	(5)
2087 HDFG: 0	14,15,16 Jan. 1980	(5)
2088 USFWS: 0	Nov. 1980	(13)
2089 USFWS: 0, ave. daily use	16 Dec. 1981 -	(13)
	15 Feb. 1982	

Kahuku (Punahoolapa) Pond(s) (now in James Campbell National Wildlife Refuge)

2090 Shallenberger: 2	15 May 1977	(3)
2091 Shallenberger: 8	28 May 1977	(3)
several undyed seen	late May 1977	MULM77
2092 HDFG: 0	27,28 July 1977	(2)
2093 HDFG: 0	12,13 Jan. 1978	(2)
2094 USFWS: 8	22 Feb. 1978	(13)
2095 HDFG: 0	27,28,30 July 1978	(5)
2096 HDFG: 0	15,16,20 Jan 1979	(5)
2097 HDFG: 0	1,2 Aug. 1979	(5)
2098 HDFG: 0	14-16 Jan. 1980	(5)

Kahuku Airstrip Pond(s)

2099 HDFG: 0	15 Jan. 1976	(2)
2100 HDFG: 0	13 Jan. 1977	(2)
2101 HDFG: 1 yellow dyed koloea from Waimea release sighted; sex undetermined	12 Apr. 1977	(36)
2102 HDFG: 0	15,16,20 Jan. 1979	(5)

Lowe Prawn Farms

2103 HDFG: 0	1,2 Aug. 1979	(5)
2104 HDFG: 0	14-16 Jan. 1980	(5)

Laie Prawn Farm

2105 HDFG: 0	1,2 Aug. 1979	(5)
2106 HDFG: 1	14-16 Jan. 1980	(5)

Kualoa Pond

2107 HDFG: 0	1 Aug. 1975	(2)
2108 HDFG: 0	15 Jan. 1976	(2)
2109 HDFG: 0	4,5 Aug. 1976	(2)
2110 HDFG: 0	27,28 July 1977	(2)
2111 HDFG: 0	12,13 Jan. 1978	(2)
2112 HDFG: 0	27,28,30 July 1978	(5)
2113 HDFG: 0	15,16,20 Jan. 1979	(5)
2114 HDFG: 0	1,2 Aug. 1979	(5)
2115 HDFG: 0	14-16 Jan. 1980	(5)

Kuilima Sewage-Pond-Swamp

2116 HDFG: 0	1 Aug. 1975	(2)
2117 HDFG: 0	15 Jan. 1976	(2)
2118 HDFG: 0	4,5 Aug. 1976	(2)
2119 HDFG: 0	13 Jan. 1977	(2)
2120 HDFG: 0	27,28 July 1977	(2)
2121 HDFG: 0	12,13 Jan. 1978	(2)
2122 HDFG: 0	27,28,30 July 1978	(5)
2123 HDFG: 0	15,16,20 Jan. 1979	(5)
2124 HDFG: 0	1,2 Aug. 1979	(5)
2125 HDFG: 0	14-16 Jan. 1980	(5)

Kuilima Golf Course

2126 HDFG: 0	13 Jan. 1977	(2)
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Kahuku Aquafarm

2127 HDFG: 0	15,16,20 Jan. 1979	(5)
2128 HDFG: 0	14-16 Jan. 1980	(5)

Kawela Corn Fields

2129 HDFG: 0 1,2 Aug. 1979 (5)

Waiapuka Shrimp Ponds (between Kahuku and Laie)

2130 2 seen 14 May 1977 MULM77

HAUULA

Ku Tree Reservoir

2131 HDFG: 0 15,16,20 Jan. 1979 (5)
2132 HDFG: 0 1,2 Aug. 1979 (5)
2133 HDFG: 0 31 July, 1 Aug. 1979 (5)
2134 HDFG: 0 12 Jan. 1980 (5)
2135 HDFG: to be excluded from future censuses due to non-use
by water birds. begin July 1981 (5)

Opaeula Reservoir(s)

2136 HDFG: 0 12 Jan. 1981 (5)
2137 HDFG: to be included in future censuses due to recent
waterbird sightings begin July 1981 (5)

Waihiawa Reservoir

2138 HDFG: 0 15,16,20 Jan. 1979. (5)
2139 HDFG: 0 1,2 Aug. 1979 (5)
2140 HDFG: to be excluded from future censuses due to non-use
by water birds begin July 1981 (5)

KAHANA

Huilua Pond

2141 HDFG: 0 1 Aug. 1975 (2)
2142 HDFG: 0 15 Jan. 1976 (2)
2143 HDFG: 0 4,5 Aug. 1976 (2)
2144 HDFG: 0 13 Jan. 1977 (2)

2145 HDFG: 0	27,28 July 1977	(2)
2146 4DFG: 0	12,13 Jan. 1978	(2)
2147 HDFG: 0	15,16,20 Jan. 1979	(5)
2148 HDFG: 0	1,2 Aug. 1979	(5)
2149 HDFG: 0	31 July, 1 Aug. 1980	(5)
2150 HDFG: 0	12 Jan. 1981	(5)
2151 HDFG: to be excluded from future censuses due to non-use by water birds	begin July 1981	(5)

Kahana Stream

2152 2 adults with 7 young reported	21 May 1978	PYLR78
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Punaluu Fish Farms

2153 HDFG: 0	13 Jan. 1977	(2)
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WAIPAHAU

Apokaa

2154 HDFG: 0	1 Aug. 1975	(2)
2155 HDFG: 0	15 Jan. 1976	(2)
2156 HDFG: 0	4,5 Aug. 1976	(2)
2157 HDFG: 0	13 Jan. 1977	(2)
2158 HDFG: 0	27,28 July 1977	(2)
2159 HDFG: 0	12,13 Jan. 1978	(2)
2160 HDFG: 0	27,28,30 July 1978	(5)
2161 HDFG: 0	15,16,20 Jan. 1978	(5)
2162 HDFG: 0	1,2 Aug. 1979	(5)
2163 HDFG: 0	14-16 Jan. 1980	(5)

Leeward College Taro Field

2164 HDFG: 0	1 Aug. 1975	(2)
2165 HDFG: 0	15 Jan. 1976	(2)

Pearl City Peninsula

2166 HDFG: 0	1 Aug. 1975	(2)
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2167 HDFG: 0	15 Jan. 1976	(2)
Pearl City (Waiawa) Unit, Pearl Harbor National Wildlife Refuge		
2168 USFWS: 0	Jan. 1976	(13)
2169 USFWS: 0	Feb. 1976	(13)
2170 USFWS: 0	May. 1976	(13)
2171 USFWS: 0	June 1976	(13)
2172 USFWS: 0	July 1976	(13)
2173 HDFG: 0	4,5 Aug. 1976	(2)
2174 USFWS: 0	Aug. 1976	(13)
2175 USFWS: 1	24 Sep. 1976	(13)
2176 USFWS: 16	7 Oct. 1976	(13)
2177 USFWS: 0	Nov. 1976	(13)
2178 USFWS: 0	Dec. 1976	(13)
2179 HDFG: 0	13 Jan. 1977	(2)
2180 USFWS: 0	Jan. 1977	(13)
2181 USFWS: 0	Feb. 1977	(13)
2182 USFWS: 0	Mar. 1977	(13)
2183 USFWS: 0	Apr. 1977	(13)
2184 USFWS: 0	May 1977	(13)
2185 USFWS: 0	June 1977	(13)
2186 HDFG: 0	27,28 July 1977	(2)
2187 USFWS: 0	July 1977	(13)
2188 USFWS: 0	Aug. 1977	(13)
2189 USFWS: 0	Oct. 1977	(13)
2190 USFWS: 0	Nov. 1977	(13)
2191 USFWS: 1, max. No. censused	2 Aug. 1976 -	(45)
	27 Dec. 1977	
2192 USFWS: 0	Dec. 1977	(13)
2193 HDFG: 0	12,13 Jan. 1978	(2)
2194 USFWS: 0	Jan. 1978	(13)
2195 USFWS: 0	Feb. 1978	(13)
2196 USFWS: 0	Mar. 1978	(13)
2197 USFWS: 0	Apr. 1978	(13)
2198 USFWS: 0	May 1978	(13)
2199 USFWS: 0	June 1978	(13)
2200 HDFG: 0	27,28,30 July 1978	(5)
2201 USFWS: 0	July 1978	(13)
2202 USFWS: 0	Aug. 1978	(13)

2203 USFWS: 0
 2204 USFWS: 0
 2205 USFWS: 3 (koloa?)
 2206 USFWS: 5 (koloa?)
 2207 USFWS: 6 (koloa?)
 2208 HDFG: 0
 2209 USFWS: 10
 2210 USFWS: 0
 2211 HDFG: 0
 2212 USFWS: 0
 2213 USFWS: 0
 2214 USFWS: 0
 2215 USFWS: 0
 2216 HDFG: 0
 2217 USFWS: 0
 2218 USFWS: 0, ave. daily use
 2219 USFWS: 0, ave. daily use

 2220 USFWS: 0, ave. daily use
 2221 USFWS: not censused
 2222 USFWS: 0, ave. daily use
 2223 USFWS: 0, ave. daily use
 2224 USFWS: 0, ave. daily use

Sumida Watercress Farm, Waiau

2225 HDFG: 0
 2226 HDFG: 0
 2227 HDFG: 0

Ted Makalena Golf Course

2228 HDFG: 0

Waipahu Dump

2229 HDFG: 0
 2230 HDFG: 0
 2231 HDFG: 0
 2232 HDFG: 0

Sep. 1978 (13)
 Oct. 1978 (13)
 15 Nov. 1978 (13)
 27 Nov. 1978 (13)
 9 Dec. 1978 (13)
 15,16,20 Jan. 1979 (5)
 23 Jan. 1979 (13)
 Feb. 1979 (13)
 1,2 Aug. 1979 (5)
 Sep. 1979 (13)
 Oct. 1979 (13)
 Nov. 1979 (13)
 Dec. 1979 (13)
 14,15,16 Jan. 1980 (5)
 Dec. 1980 (13)
 15 Nov.-15 Dec.1981 (13)
 16 Dec. 1981 - (13)
 15 Jan. 1982
 16 Jan.-15 Feb. 1982 (13)
 16 Feb.-31 Mar. 1982 (13)
 Apr. 1982 (13)
 May 1982 (13)
 June 1982 (13)

1 Aug. 1975 (2)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)

15 Jan. 1976 (2)

1 Aug. 1975 (2)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)

2233 HDFG: 0
2234 HDFG: 0
2235 HDFG: 0
2236 HDFG: 0
2237 HDFG: 0
2238 HDFG: 0

27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Waipio Sewage

2239 HDFG: 0
2240 HDFG: 0
2241 HDFG: 0
2242 HDFG: 0
2243 HDFG: 0

1 Aug. 1975 (2)
4,5 Aug. 1976 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Waikele

2244 HDFG: 0
2245 HDFG: 0
2246 HDFG: 0
2247 HDFG: 0
2248 HDFG: 0
2249 HDFG: 0
2250 HDFG: 0
2251 HDFG: 0
2252 HDFG: 0

1 Aug. 1975 (2)
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

KANEOHE

Heeia-Fishpond-Meadows-Wetlands-Marsh-Pond

2253 HDFG: 0
2254 HDFG: 0
2255 HDFG: 5 (wetlands)
2256 HDFG: 0
2257 HDFG: 0
2258 HDFG: 0
2259 HDFG: 0

15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1978 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Kahaluu Pond

2260 HDFG: 0

4,5 Aug. 1976 (2)

MOKAPU

Kaelepulu Pond (now Enchanted Lake Subdivision)

2261 pair seen

27 Oct. 1940 (20)

2262 1, possibly koloa

4 Jan. 1947 DONW47

2263 occasionally observed

(1946-1947) SCHC53

2264 1 seen

23 Mar.-14 Apr. 1958 EASW58

2265 HDFG: 0

1 Aug. 1975 (2)

2266 HDFG: 2

15 Jan. 1976 (2)

2267 HDFG: 0

4,5 Aug. 1976 (2)

2268 HDFG: 0

13 Jan. 1977 (2)

2269 HDFG: 0

27,28 July 1977 (2)

2270 HDFG: 1

12,13 Jan. 1978 (2)

2271 HDFG: 0

27,28,30 July 1978 (5)

2272 HDFG: 0

15,16,20 Jan. 1979 (5)

2273 HDFG: 0

1,2 Aug. 1979 (5)

2274 HDFG: 0

14-16 Jan. 1980 (5)

Kaelepula Flood Control

2275 HDFG: 2

15 Jan. 1976 (35)

2276 HDFG: 0

27,28 July 1977 (2)

2277 HDFG: 0

12,13 Jan. 1978 (2)

2278 HDFG: 6

15,16,20 Jan. 1979 (5)

2279 HDFG: 6

1,2 Aug. 1979 (5)

Kaelepulu Canal - Hamakua Drive

2280 Shallenberger: pair with single young seen

24 Jan. 1977 (3)

2281 pair hatched 6 first successful nesting recorded on
on O'ahu in recent years

late Jan. 1977 PYLR77

2282 one of a brood of 6 remained

end of Feb. 1977 PYLR77

Kailua

2283	some boys caught 14, two recorded broods, on the beach near the outlet of Kaelepulu Pond	(1944)	MUNG44
2284	watched a family for about an hour on the bank of a slough	2 Dec. 1952	ANON53
2284a	USFWS:female took up residence with domestic ducks	25 Jan. 1971	(12)
2285	Conant: 2 seen flying south from Kailua Drive-In on Pali Highway	15 May 1977	CAMG77

Kane Kai

2286	HDFG: to be included in future censuses due to recent water bird sightings	begin July 1981	(5)
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Kaneohe Marine Corps Air Station - Mokapu Peninsula

2287	5, Christmas Count	26 Dec. 1984	PORR49
2288	Shallenberger:HDFG began to release captive-raised stock	1969	(3)
2289	HDFG: 2	1-5 Aug. 1974	(1)
2290	1 seen near release pen containing individuals dyed red (those to be released in Kawainui Swamp dyed yellow)	10 Nov. 1974	WILE75
2291	4 Pohakuloa-raised young released	(?1974)	HAWS75
2292	HDFG: 0	1 Aug. 1975	(2)
2293	HDFG: 0	15 Jan. 1976	(2)
2294	HDFG: 0	4,5 Aug. 1976	(2)
2295	HDFG: 0	13 Jan. 1977	(2)
2296	HDFG: 1	14 Jan. 1980	(33)

Nuupia Pond(s) (Kaneohe Marine Corps Air Station)

2297	saw 2 dyed red, 1 undyed	17 Feb. 1974	WILE75
2298	HDFG: 19 released	15 Nov. 1974	(35)
2299	HDFG: 6 released	5 June 1974	(35)
2299a	HDFG: 2 seen	2 Aug. 1974	(8)
2299b	HDFG: 20 released	15 Nov. 1974	(8)
2299c	HDFG: 6 seen (red dye visible)	25 Nov. 1974	(8)
2299d	HDFG: 3 seen (red dye visible)	22 Apr. 1975	(8)
2299e	HDFG: 2 seen (red dye visible)	1 May 1975	(8)
2299f	HDFG: 2 seen (red dye visible)	14 May 1975	(8)
2300	HDFG: 3 sighted without dye on man-made islands	28 May 1976	(35)

2301	ca. 15 dyed light-red released	mid-Feb. 1977	PYLR77
2302	14 of 15 still near pen	27 Feb. 1977	PYLR77
2303	HDFG: 10 drakes and 10 ducks (captive-raised and banded at Pohakuloa) were dyed red and released after 30 days in holding pen	27 Feb. 1977	(36)
2304	HDFG: 13 red-dyed koloa released on 24 Feb. sighted next to released pen	28 Feb. 1977	(36)
2305	HDFG: 4 red-dyed koloa sighted	12 May 1977	(36)
2306	HDFG: 2 red-dyed koloa sighted	13 May 1977	(36)
2307	HDFG: 2 of unrecorded dye color sighted	14 May 1977	(36)
2308	HDFG: 2 red-dyed koloa sighted	17 May 1977	(36)
2309	HDFG: 2 red-dyed and 1 undyed koloa sighted	18 May 1977	(36)
2310	HDFG: 2 red-dyed koloa sighted	25 May 1977	(36)
2311	HDFG: 2 red-dyed koloa sighted	7 June 1977	(36)
2312	HDFG: 0	27,28 July 1977	(2)
2313	HDFG: 0	12,13 Jan. 1978	(2)
2314	HDFG: 0	27,28,30 July 1978	(5)
2314a	HDFG: 1	25 Aug. 1978	(55)
2315	HDFG: 0	15,16,20 Jan. 1979	(5)
2316	HDFG: 6 sighted	8 Feb. 1979	(34)
2317	2 seen near released pens	11 Feb. 1979	PYLR79
2318	HDFG: 0	1,2 Aug. 1979	(5)
2319	HDFG: 1	14,15,16 Jan. 1980	(5)

Kaneohe Marine Corps Air Station Sewage Lagoon

2320	HDFG: undyed duck with 6 ducklings sighted	7 Mar. 1977	(36)
2321	Shallenberger: 1 adult plus 1 young sighted	30 May 1977	(3)
2322	HDFG: 1 green-dyed koloa (Kawainui release) sighted	21 June 1977	(36)
2323	HDFG: 1 duck with 7 ducklings sighted	23 June 1977	(36)
2324	Shallenberger: 1 adult plus 1 young sighted	28 June 1977	(3)
2325	HDFG: 1 duck with 1 young sighted (probably same brood sighted 15 May except 3 ducklings missing)	28 June 1977	(36)
2326	HDFG: 0	12,13 Jan. 1978	(2)
2327	HDFG: 0	27,28,30 July 1978	(5)
2328	HDFG: 0	1,2 Aug. 1979	(5)
2329	HDFG: 0	14,15,16 Jan. 1980	(5)

Kawainui-Pond-Swamp

2330 unsuccessful search	9 Feb. 1947	KLER47
2331 occasionally observed	(1946-1947)	SCHC53
2332 USFWS: 4 unbanded observed... may be a portion of a residual population that has survived, or more likely are progeny from a small flock of semi-wild free flying banded koloa... maintained at the Honolulu Zoo	21 Dec. 1968	(12)
2333 2 seen... first such sighting on O'ahu in ca. 15 years	2 Jan. 1969	ANON69
2334 HDFG: 32 released	17 Jan. 1969	(35)
2335 USFWS: released koloa remaining in the area...1 found dead on Kailua Intermediate School grounds	(Jan.) 1969	(12)
2336 9, Christmas Count	28 Dec. 1969	ANON70
2337 HDFG: 2	8 Aug. 1973	(1)
2338 HDFG 24 released	3 Mar. 1974	(35)
2339 HDFG: 21 released	29 Nov. 1974	(35)
2339aHDFG: 10 seen	23 Jan. 1975	(8)
2340 dyed and undyed koloa seen	(17 Feb. 1975)	ANON75
2341 3 yellow-dyed koloa seen	12,13 Mar. 1975	ANON75
2342 HDFG: 2	1 Aug. 1975	(2)
2343 HDFG: 5	1 Aug. 1975	(1)
2344 HDFG: 2	15 Oct. 1975	(35)
2345 HDFG: 0	15 Jan. 1976	(2)
2346 HDFG: 2	1 July 1975 -	(35)
releases of 58 young (29 on 27 Feb. and 29 on (55) 4 Mar.) were made bringing total release on O'ahu since 1968 to 158...future releases should be on alternate sites free of feral mallards or mallards should be eliminated	30 June 1976	
2347 HDFG: 3 sighted...probably from prveious years releases	8 Feb. 1976	(35)
2348 HDFG: 29 released	27 Feb. 1976	(35)
2349 HDFG: 25, previous day's release	28 Feb. 1976	(35)
2350 HDFG: 20 sighted from release of 4 March 1976	25 Mar. 1976	(35)
2351 HDFG: 33 sighted from two 1976 releases	8 Apr. 1976	(35)
2352 HDFG: 17 sighted from two 1976 releases	9 Apr. 1976	(35)
2353 HDFG: 12 sighted from two 1976 releases	12 Apr. 1976	(35)
2354 HDFG: 14 sighted ... 1 without color dye	11 May 1976	(35)
2355 HDFG: 11 undyed koloa censused	4 Aug. 1976	(2)
2356 HDFG: 8 undyed koloa sighted (large pond)	11 Oct. 1976	(36)
2357 HDFG: 6 undyed koloa sighted (release site)	11 Oct. 1976	(36)
2358 HDFG: 0	13 Jan. 1977	(2)

2359	HDFG: 11 undyed koloea sighted	13 Jan. 1977	(36)
2360	HDFG: 9 undyed koloea attracted by penned birds	7 Feb. 1977	(36)
2361	HDFG: 3 undyed koloea attracted by penned birds	20 Feb. 1977	(36)
2362	HDFG: 2 undyed koloea attracted by penned birds	27 Feb. 1977	(36)
2363	HDFG: 6 undyed koloea attracted by penned birds	1 Mar. 1977	(36)
2364	HDFG: 14 drakes and 20 ducks (captive-raised at Pohakuloa were banded, dyed green and released after 34 days in holding pen	11 Mar. 1977	(36)
2365	HDFG: 34 released	11 Mar. 1977	(36)
2366	HDFG: 2 undyed koloea sighted near release site	22 Mar. 1977	(36)
2367	HDFG: 2 drakes, 1 duck (all dyed green) sighted near release site	22 Mar. 1977	(36)
2368	HDFG: 1 green and 1 undyed sighted near release site	22 Mar. 1977	(36)
2369	HDFG: 2 undyed koloea sighted near release site	22 Mar. 1977	(36)
2370	Shallenberger: HDFG has released more than 165 captive-reared koloea since 1969...we have found that a thorough survey through flooded grassland in the upstream portions of the marsh will invariably turn up at least six birds. We have recorded as many as 16 birds in one trip, but the highest count during this survey (1,20,23,28 May; 15 August) was 13...no nests or young birds found on this survey	Mar. 1977	(3)
2371	HDFG: 13	27,28 July 1977	(2)
2372	6 undyed birds attracted to release site	13 Nov. 1977	SHAR78
2373	as many as 11 incl. 3 unbanded attracted to release site	(ca. 20 Nov. 1977)	SHAR78
2374	HDFG: 27 (captive-raised at Pohakuloa) released	30 Nov. 1977	(34)
2375	successful nesting	(1977)	SHAR78
2376	HDFG: 16	12,13 Jan. 1978	(2)
2377	HDFG: 0 (main pond)	27,28,30 July 1978	(5)
2378	HDFG: 8	28 July 1978	(34)
2379	HDFG: 26 sighted	15 Jan. 1979	(34)
2380	HDFG: 6	15,16,20 Jan. 1979	(5)
2381	HDFG: 15 drakes and 17 ducks (captive-raised at Pohakuloa) were banded, dyed green and released after 32 days in the holding pen	17 Apr. 1979	(34)
2382	HDFG: 0	1,2 Aug. 1979	(5)
2383	HDFG: 8	14 Jan. 1980	(33)
2384	HDFG: 1 (?main pond)	14,15,16 Jan. 1980	(5)
2385	HDFG: 1 (below heiau)	14,15,16 Jan. 1980	(5)

Hamakua Drive - Kawainui Pasture

2386 HDFG: 1 (not dyed)	4,5 Aug. 1976	(2)
2387 HDFG: 0	13 Jan. 1977	(2)
2388 Shallenberger: probable nesting site where 24 January sighting of pair with brood originated...observed as many as five koloa in this area later	(since 24 Jan.)1977	(3)
2389 HDFG: 1 (undyed), (along Kahanaiki Stream)	30 Mar. 1977	(36)
2390 HDFG: 0	27,28 July 1977	(2)
2391 HDFG: 1	12,13 Jan. 1978	(2)
2392 1 adult with 6 ducklings seen...up to 6 other adults also present (2 remaining on 1 and 11 June)	29 Mar.,24 Apr., 6 May 1978	PYLR78
2393 HDFG: 2 adults and 12 young sighted	2 July 1978	(34)
2394 HDFG: 3	27,28,30 July 1978	(5)
2395 HDFG: 27	15,16,20 Jan. 1979	(34)
		(5)
2396 HDFG: 0	1,2 Aug. 1979	(5)
2397 4 present	11 Nov. 1979	PYLR81
2398 8 present	14-16 Jan. 1980	(33)

Kawainui Berm

2399 HDFG: 0	27,28,30 July 1978	(5)
2400 HDFG: 0	1,2 Aug. 1979	(5)
2401 HDFG: 0	14-16 Jan. 1980	(5)

Hamakua Ditch - Maunawili Stream

2402 HDFG: 3, (H. Ditch), 8 (M. Stream)	27,28,30 July 1978	(5)
2403 HDFG: 7	15,16,20 Jan. 1979	(5)
2404 HDFG: 2 (green)	24 May 1979	(34)
2405 HDFG: 0	1,2 Aug. 1979	(5)
2406 HDFG: 2	14-16 Jan. 1980	(5)

Hamakua-Holiday Mart-Wigwam-Ditch

2407 HDFG: 2	8 Aug. 1973	(1)
2408 HDFG: 0	1 Aug. 1975	(2)
2409 HDFG: 0	15 Jan. 1976	(2)

2410 HDFG: 3	27,28,30 July 1978	(5)
Lanikai (Area)		
2411 HDFG: 0	27,28 July 1977	(2)
2412 15, Christmas Count	18 Dec. 1977	PYLR78
2413 18, Christmas Count	17 Dec. 1978	PYLR79
Olomana Saddle City		
2414 HDFG: 0	1,2 Aug. 1979	(5)
Mokulua Islets		
2415 Northwood: found 2 nests with eggs	16, June 1935	(20)
2416 several nests seen and as many as 6 birds at a time were flying around	(1935-1937)	MUNG46
2417 Northwood: eggs taken	ca. 1 Mar. 1940	(20)
2418 Woodside: saw 5 nests...contained 8 to 10 eggs...on one of the islets	9 Mar. 1941	MUNG44
2419 nests on the steep grassy side of Mokulua (both islets)	(1941)	MUNG41
2420 nesting on the twin islands of Mokulua off Lanikai... returning carrying or swimming the chicks to the Kawainui swamp at Kailua or in the outlet of the Kaelepulu pond by Lanikai	(1944)	MUNG44
2421 still occasionally nests	(1946-1947)	SCHC53
2422 occasionally observed	(1946-1947)	SCHC53
2423 none seen	3 May 1953	HATG53
PUULO A		
Waipio		
2424 6 found	17 Dec. 1977	PYLR78
2425 11 present	22 Apr. 1978	PYLR78
2426 11 is a good count	4 July 1979	PYLR80
2427 up to 7 seen regularly through the fall	Aug. 1979-July 1980	PYLR81

Waipio Basins

2428 HDFG: 0	1 Aug. 1975	(2)
2429 HDFG: 0	4,5 Aug. 1976	(2)
2430 HDFG: 0	27,28 July	(2)
2431 HDFG: 0	15,16,20 Jan. 1979	(5)
2432 HDFG: 0	1,2 Aug. 1979	(5)
2433 HDFG: 0	14-16 Jan. 1980	(5)

Waipio Peninsula

2434 HDFG: 0	15 Jan. 1976	(2)
2435 USFWS: 2 (Big Pond)	18 July 1976	(13)
2436 Shallenberger: 2 counted on ponds	18 July 1976	(3)
2437 2 flushed (irrigation canal)	9 Jan. 1977	PYLR77
2438 HDFG: 0	13 Jan. 1977	(2)
2439 seen more regularly	fall 1977	PYLR78
2440 high of 15 seen	24 Sep. 1977	PYLR78
2441 8, Christmas Count	18 Dec. 1977	STEM78
2442 HDFG: 0	12,13 Jan. 1978	(2)
2443 2 counted	9 July 1978	LEPJ78
2444 HDFG: 0	27,28,30 July 1978	(5)
2445 7, Christmas Count	16 Dec. 1978	STEM79
2446 seen	12 Oct. 1980	DONP80
2447 at least 3 seen, pairs flying overhead on at least 3 occasions may have been the same 2 birds	15 Sep. 1981	PYLR81

Walker's Bay

2448 HDFG: 0	1 Aug. 1975	(2)
2449 HDFG: 0	15 Jan. 1976	(2)
2450 HDFG: 0	4,5 Aug. 1976	(2)
2451 HDFG: 0	13 Jan. 1977	(2)
2452 HDFG: 0	27,28 July 1977	(2)
2453 HDFG: 0	12,13 Jan. 1978	(2)
2454 HDFG: 0	27,28,30 July 1978	(5)
2455 HDFG: 0	15,16,20 Jan. 1979	(5)
2456 HDFG: 0	1,2 Aug. 1979	(5)
2457 HDFG: 0	14-16 Jan. 1980	(5)

West Loch (Honouliuli) Unit, Pearl Harbor National Wildlife Refuge

2458 HDFG: 0	1 Aug. 1975	(2)
2459 USFWS: 0	Jan. 1976	(13)
2460 USFWS: 0	July 1976	(13)
2461 HDFG: 0	4,5 Aug. 1976	(2)
2462 USFWS: 0	Aug. 1976	(13)
2463 USFWS: 0	Sep. 1976	(13)
2464 USFWS: 0	Oct. 1976	(13)
2465 USFWS: 0	Nov. 1976	(13)
2466 USFWS: 0	Dec. 1976	(13)
2467 HDFG: 0	13 Jan. 1977	(2)
2468 USFWS: 0	Jan. 1977	(13)
2469 USFWS: 0	Feb. 1977	(13)
2470 USFWS: 0	Mar. 1977	(13)
2471 USFWS: 0	Apr. 1977	(13)
2472 USFWS: 0	May 1977	(13)
2473 USFWS: 0	June 1977	(13)
2474 HDFG: 0	27,28 July 1977	(2)
2475 USFWS: 0	July 1977	(13)
2476 USFWS: 0	Aug. 1977	(13)
2477 USFWS: 0	Sep. 1977	(13)
2478 USFWS: 0	Oct. 1977	(13)
2479 USFWS: 0	Nov. 1977	(13)
2480 USFWS: 2, max. no. censused	2 Aug. 1976 -	(45)
	27 Dec. 1977	
2481 USFWS: 0	Dec. 1977	(13)
2482 Shallenberger: has been observed since 18 July 1976	(1977)	(3)
2483 HDFG: 0	12,13 Jan. 1978	(2)
2484 USFWS: 0	Jan. 1978	(13)
2485 USFWS: 0	Feb. 1978	(13)
2486 USFWS: 0	Mar. 1978	(13)
2487 USFWS: 0	Apr. 1978	(13)
2488 USFWS: 1	9 May 1978	(13)
2489 USFWS: 2	10 May 1978	(13)
2490 USFWS: 0	June 1978	(13)
2491 USFWS: 3 (?koloa)	17 June 1978	(13)
2492 USFWS: 2 (?koloa)	18 June 1978	(13)
2493 USFWS: 2 (?koloa)	21 June 1978	(13)
2494 USFWS: 2 (?koloa)	22 June 1978	(13)

2495 USFWS: 2	1 July 1978	(13)
2496 USFWS: 2	7 July 1978	(13)
2497 HDFG: 0	27,28,30 July 1978	(5)
2498 USFWS: 2 (?koloa)	2 Aug. 1978	(13)
2499 USFWS: 1 (?koloa)	7 Aug. 1978	(13)
2500 USFWS: 2 (?koloa)	8 Aug. 1978	(13)
2501 USFWS: 0	Aug. 1978	(13)
2502 USFWS: 2	9 Sep. 1978	(13)
2503 USFWS: 2 (?koloa)	9 Sep. 1978	(13)
2504 USFWS: 0	Oct. 1978	(13)
2505 USFWS: 8 (?koloa)	6 Nov. 1978	(13)
2506 Walker: total of 7 seen on 4 of 36 censuses...maximum of 2 seen per census when present	28 Jan.-8 Nov. 1978	(45)
2507 USFWS: 14 (?koloa)	30 Nov. 1978	(13)
2508 USFWS: 6 (?koloa)	9 Dec. 1978	(13)
2509 HDFG: 0	15,16,20 Jan. 1979	(5)
2510 USFWS: 0	15 Jan. 1979	(13)
2511 USFWS: 12 (?koloa)	23 Jan. 1979	(13)
2512 USFWS: 2 (?koloa)	6 Feb. 1979	(13)
2513 USFWS: 3 (?koloa)	28 Mar. 1979	(13)
2514 HDFG: 0	1,2 Aug. 1979	(5)
2515 USFWS: 0	Sep. 1979	(13)
2516 USFWS: 0	Oct. 1979	(13)
2517 USFWS: 0	Nov. 1979	(13)
2518 USFWS: 0	Dec. 1979	(13)
2519 HDFG: 0	14-16 Jan. 1980	(5)
2520 USFWS: 2, ave. daily use	15 Nov.-15 Dec. 1981	(13)
2521 USFWS: 1, ave. daily use	16 Dec. 1981 -	(13)
	15 Jan. 1982	
2522 USFWS: 3, ave. daily use	16 Jan.-15 Feb. 1982	(13)
2523 USFWS: 0, ave. daily use	16 Feb.-31 Mar. 1982	(13)
2524 USFWS: 0, ave. daily use	Apr. 1982	(13)
2525 USFWS: 0, ave. daily use	May 1982	(13)
2526 USFWS: 0, ave. daily use	June 1982	(13)

Fort Kamehameha

2527 HDFG: 0	1 Aug. 1975	(2)
2528 HDFG: 0	15 Jan. 1976	(2)
2529 HDFG: 0	4,5 Aug. 1976	(2)

2530 HDFG: 0
 2531 HDFG: 0
 2532 HDFG: 0
 2533 HDFG: 0
 2534 HDFG: 0
 2535 HDFG: 0
 2536 HDFG: 0

13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Honouliuli

2537 HDFG: 0
 2538 HDFG: 0
 2539 HDFG: 0
 2540 HDFG: 0
 2541 HDFG: 0
 2542 HDFG: 0
 2543 HDFG: 0
 2544 HDFG: 0
 2545 HDFG: 0

1 Aug. 1975 (2)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Rabbit (Fort) Island

2546 wild ducks seen

17 May 1825 BLOA25

HONOLULU

Keehi Lagoon and Islets

2547 HDFG: 0
 2548 HDFG: 0
 2549 HDFG: 0
 2550 HDFG: 0
 2551 HDFG: 0
 2552 HDFG: 0
 2553 HDFG: 0
 2554 HDFG: 0
 2555 HDFG: 0
 2556 HDFG: 0

1 Aug. 1975 (2)
 15 Jan. 1976 (2)
 4,5 Aug. 1976 (2)
 13 Jan. 1977 (2)
 27,28 July 1977 (2)
 12,13 Jan. 1978 (2)
 27,28,30 July 1978 (5)
 15,16,20 Jan. 1979 (5)
 1,2 Aug. 1979 (5)
 14-16 Jan. 1980 (5)

Black Point (Kupikipikio), Diamond Head

2557 HDFG: duck with 8 ducklings reported in resident's yard... ducklings caught by staff and raised	11 Apr. 1972	(35)
2558 Shallenberger: brood previously reported	1977	(3)

Diamond Head

2559 19 shot in pond (in crater)	ca. 1900	COUH19
2560 3, Christmas Count (from free-flying Honolulu Zoo population)	29 Dec. 1968	ANON69
2561 6 regularly seen (from free-flying Honolulu Zoo population)	27 Dec. 1970	MULW71
2562 2, Christmas Count (from free-flying Honolulu Zoo population)	27 Dec. 1970	MULW71

Kaau Crater (lake in bottom)

2563 Shallenberger: pair seen (marginal habitat)	17 Aug. 1977	(3)
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Kapiolani Park - Honolulu Zoo

2564 HDFG: 12 released in Kapiolani Park by Honolulu Zoo	13 May 1968	(35)
2565 6, Christmas Count (from free-flying Honolulu Zoo flock)	28 Dec. 1969	ANON70
2566 9, Christmas Count (from free-flying Honolulu Zoo flock)	27 Dec. 1970	MULW71
2567 3, Christmas Count (from free-flying Honolulu Zoo flock)	26 Dec. 1971	MULW72
2568 2, Christmas Count (? from free-flying Honolulu Zoo flock)	17 Dec. 1972	MULW72

Manoa Stream

2569 HDFG: 1 from February 1976 release at Kawainui swamp observed...direct line distance of ca. 6 miles... indicating flight capabilities achieved sometime within 28 days after release	28 Mar. 1976	(35)
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Nuuanu Reservoirs

2570 HDFG: 0	1 Aug. 1975	(2)
2571 HDFG: 0	15 Jan. 1976	(2)
2572 HDFG: 0	4,5 Aug. 1976	(2)

2573 HDFG: 0	13 Jan. 1977	(2)
2574 HDFG: 2 (undyed)	13 Jan. 1977	(36)
2575 HDFG: 0	27,28 July 1977	(2)
2576 HDFG: 2 (Reservoirs 3 & 4)	27,28 July 1977	(2)
2577 HDFG: 0	12,13 Jan. 1978	(2)
2578 HDFG: 5 (Reservoirs 3 & 4)	12,13 Jan. 1978	(2)
2579 HDFG: 0	27,28,30 July 1978	(5)
2580 HDFG: 0	15,16,20 Jan. 1979	(5)
2581 HDFG: 2 (Reservoir 3)	1,2 Aug. 1979	(5)
2582 HDFG: 0 (Reservoirs 2 & 4)	1,2 Aug. 1979	(5)
2583 HDFG: 0	14,15,16 Jan. 1980	(5)
2584 HDFG: 0	31 July, 1 Aug. 1980	(5)
2585 HDFG: 0	12 Jan. 1981	(5)
2586 HDFG: to be excluded from future censuses due to non-use by water birds	begin July 1981	(5)

Punchbowl Crater (pond in bottom)

2587 saw 2, believe to be koloa	17 Dec. 1890	MUNG44
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Salt Lake

2588 1 seen	23 Mar.-14 Apr. 1958	EASW58
2589 pair seen	8 Mar. 1970	MULW70
2590 3 was most seen at any one time past 2 years	(1972)	MULW72
2591 HDFG: 1	1-5 Aug. 1974	(1)
2592 HDFG: 0	1 Aug. 1975	(2)
2593 HDFG: 0	15 Jan. 1976	(2)
2594 HDFG: 0	4,5 Aug. 1976	(2)
2595 HDFG: 0	13 Jan. 1977	(2)
2596 HDFG: 0	27,28 July 1977	(2)
2597 HDFG: 0	12,13 Jan. 1978	(2)
2598 HDFG: 0	27,28,30 July 1978	(5)
2599 HDFG: 0	15,16,20 Jan. 1979	(5)
2600 HDFG: 0	1,2 Aug. 1979	(5)
2601 HDFG: 0	14-16 Jan. 1980	(5)

Waikiki

2602	abundance of excellent shooting...ducks...being found in great abundance	8 Mar. 1792	BELE29
2603	resort of wild ducks (several hundreds)	10 May 1825	BLOA25

KOKO HEAD

Bellows Air Force Base

2604	duck with 6 ducklings seen on small stream near the field	9 Feb. 1947	KLER47
2605	HDFG: 1	13,14 Jan. 1966	(1)
2606	HDFG: 0	1 Aug. 1975	(2)
2607	HDFG: 0	15 Jan. 1976	(2)
2608	HDFG: 0	4,5 Aug. 1976	(2)
2609	HDFG: 0	13 Jan. 1977	(2)
2610	HDFG: 0	27,28 July 1977	(2)
2611	HDFG: 3	12,13 Jan. 1978	(2)
2612	HDFG: 0	27,28,30 July 1978	(5)
2613	HDFG: 0	15,16,20 Jan. 1979	(5)
2614	HDFG: 0	1,2 Aug. 1979	(5)
2615	HDFG: 0	14-16 Jan. 1980	(5)
2616	HDFG: 0	12 Jan. 1981	(5)

Kuapa Pond

2617	HDFG: 0	4,5 Aug. 1976	(2)
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Paiko Lagoon

2618	HDFG: 0	1 Aug. 1975	(2)
2619	HDFG: 0	15 Jan. 1976	(2)
2620	HDFG: 0	4,5 Aug. 1976	(2)
2621	HDFG: 0	13 Jan. 1977	(2)
2622	HDFG: 0	27,28 July 1977	(2)
2623	HDFG: 0	12,13 Jan. 1978	(2)
2624	HDFG: 0	27,28,30 July 1978	(5)
2625	HDFG: 0	15,16,20 Jan. 1979	(5)
2626	HDFG: 0	1,2 Aug. 1979	(5)
2627	HDFG: 0	14-16 Jan. 1980	(5)

Waimanalo Marsh

2628 saw flocks
2629 Northwood: 2 pairs in stream with 2 ducklings

June-July 1879
30 Dec. 1939
FINO80
(20)

Island of Moloka'i

ISLANDWIDE INFERENCE

2630 none seen ... doubt very much if there are any now
living (on Moloka'i)
2631 J.D.Smith: known to occur (historically)
2632 HDFG: thought to be extinct or extirpated from Moloka'i
2633 HDFG: 0
2634 HDFG: 0
2635 HDFG: 0

15 Apr.-15 June 1907 BRYW08
(1953) SCHC53
(1969) (7)
14-16 Jan. 1980 (5)
31 July-1 Aug. 1980 (5)
112-14 Jan. 1981 (5)

MULTIQUADRANGLE

2636 reportedly always seen frequenting high mountain pools at
the Halawa end of the island
2637 Shallenberger: Pekelo indicated that the most recent
report of this species was in the Kawela area
2638 HDFG: 0, Lee Shores
2639 HDFG: 0, Kamalo to Halawa
2640 HDFG: 0, Lee Shores
2641 HDFG: 0, Kamalo to Halawa
2642 HDFG: 0, Kamalo to Halawa
2643 HDFG: 0, Kaunakakai to Kamalo
2644 HDFG: 0, Lee Shores

(prior 1907) BRYW08
1930's (3)
27,28,30 July 1978 (5)
27,28,30 July 1978 (5)
1,2 Aug. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
14-16 Jan. 1980 (5)
14-16 Jan. 1980 (5)

QUADRANGLE/LOCALITY

ILIO POINT

Ilio

2645 HDFG: 0

27,28,30 July 1978 (5)

Popohaku

2646 HDFG: 0	27,28,30 July 1978	(5)
2647 HDFG: 0	15,16,20 Jan. 1979	(5)
2648 HDFG: 0	1,2 Aug. 1979	(5)
2649 HDFG: 0	14-16 Jan. 1980	(5)

MOLOKAI AIRPORT

Maunaloa

2650 HDFG: 0	14-16 Jan. 1980	(5)
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Moomomi

2651 HDFG: 0	27,28,30 July 1978	(5)
2652 HDFG: 0	15,16,20 Jan. 1979	(5)
2653 HDFG: 0	1,2 Aug. 1979	(5)
2654 HDFG: 0	14-16 Jan. 1980	(5)

KAUNAKAKAI

Kalae (?Meyer Lake)

2655 HDFG: 0	1,2 Aug. 1979	(5)
2656 HDFG: 0	14-16 Jan. 1980	(5)

Kaunakakai

2657 HDFG: 0	27,28,30 July 1978	(5)
2658 HDFG: 0	15,16,20 Jan. 1979	(5)
2659 HDFG: 0	1,2 Aug. 1979	(5)
2660 HDFG: 0	14-16 Jan. 1980	(5)

Kuulapuu Reservoir

2661 HDFG: 0	14-16 Jan. 1980	(5)
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Kaluaapuhi Fishpond

2662 HDFG: 0	14-16 Jan. 1980	(5)
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KAMALO

Kakahaia National Wildlife Refuge

2663 HDFG: 0 (Kawela)	27,28,30 July 1978	(5)
2664 HDFG: 0 (Kawela)	15,16,20 Jan. 1979	(5)
2665 HDFG: 0	1,2 Aug. 1979	(5)
2666 HDFG: 0	14-16 Jan. 1980	(5)
2667 USFWS: 0, ave. daily use	16 Dec. 1981 -	(13)
	15 Jan. 1982	

Kamalo

2668 HDFG: 0	15,16,20 Jan. 1979	(5)
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Makakupaia

2669 Perkins: 1 seen up from Makakupaia (camp)	20 May (1893)	(15)
2670 Perkins: pair seen	11 June (1893)	(15)
2671 Perkins: generally 1 or more seen in <u>Pritchardia</u> bog above wooden shack at Makakupia, at lowest edge of more or less continuous forest	May, June 1893	(15)

HALAWA

Halawa

2672 HDFG: 0	14-16 Jan. 1980	(5)
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Island of Maui

ISLANDWIDE INFERENCE

2673 HDFG: 0	14-18 Jan. 1963	(1)
2674 HDFG: 0	15 Jan. 1964	(1)
2675 HDFG: 0	13-15 Jan. 1965	(1)
2676 HDFG: thought to be extinct on Maui	(1969)	(7)
2677 HDFG: 0	31 July, 1 Aug. 1980	(5)
2678 HDFG: 0	12-14 Jan. 1981	(5)

UNDESIGNATED LOCALITIES

Plantation Irrigation Reservoirs (mostly in WAILUKU and PAIA quads)

2679 HDFG: 0	27,28,30 July 1978	(5)
2680 HDFG: 0	15,16,20 Jan. 1979	(5)
2681 HDFG: 0	1,2 Aug. 1979	(5)
2682 HDFG: 0	14,15,16 Jan. 1980	(5)

QUADRANGLE/LOCALITY

West Maui District

WAILUKU

Kanaha Pond

2683 estimated 18	7 July-11 Sep. 1951	BONH51	
2684 USFWS: 2 observed	14 May 1970	(12)	
2685 HDFG: 0	27,28,30 July 1978	(5)	
2686 HDFG: 0	15,16,20 Jan. 1979	(5)	
2687 HDFG: 0	1,2 Aug. 1979	(5)	
2688 HDFG: 0	14-16 Jan. 1980	(5)	

PAIA

Naska Settling Pond

2689 HDFG: 0	27,28,30 July 1978	(5)
2690 HDFG: 0	15,16,20 Jan. 1979	(5)
2691 HDFG: 0	14-16 Jan. 1980	(5)

MAALAEA

Kealia Pond

2692 HDFG: 0	27,28,30 July 1978	(5)
2693 HDFG: 0	15,16,20 Jan. 1979	(5)
2694 HDFG: 0	1,2 Aug. 1979	(5)

2695 HDFG: 0

14-16 Jan. 1980 (5)

KILOHANA

East Maui District

Olinda

2696 Perkins: 1 shot in the vicinity of Mr. Payne's
(Paine's) mountain house considerably higher up than
Olinda

28 Mar. 1894 (15)

Island of Hawai'i

ISLANDWIDE INFERENCE

2697 although by no means entirely absent from the coast...
it loves to follow the windings of the little mountain
streams

(1902) HENH02

2697aHDFG: (0)
2697bHDFG: no census
2698 HDFG: 1
2698aHDFG: (0)
2698bHDFG: (0)
2699 HDFG: 0
2700 HDFG: 45 (unlikely, report unverified)
2701 HDFG: 0
2701aHDFG: (0)
2701bHDFG: (0)
2702 HDFG: 0
2703 HDFG: 0
2704 HDFG: 0
2705 HDFG: thought to be extinct or extirpated from island
2706 HDFG: 0
2707 HDFG: 0
2708 HDFG: 0
2709 HDFG: 0
2710 HDFG: 0
2711 HDFG: 0
2712 HDFG: 5

Jan. 1958 (1)
Jan. 1959 (1)
4-8 Jan. 1960 (1)
Jan. 1961 (1)
Jan. 1962 (1)
14-18 Jan. 1963 (1)
15 Jan. 1964 (1)
13-15 Jan. 1965 (1)
Jan. 1966 (1)
Jan. 1967 (1)
24 July 1968 (5)
13 Jan. 1969 (5)
24 July 1969 (5)
(1969) (7)
15 Jan. 1970 (5)
7 Aug. 1970 (5)
12 Jan. 1971 (5)
27 July 1971 (5)
13 Jan. 1972 (5)
3 Aug. 1972 (5)
18 Jan. 1973 (5)

2713 HDFG: 0	21 June 1973	(5)
2714 HDFG: 0	8 Aug. 1973	(5)
2715 HDFG: 1	15 Jan. 1974	(5)
2716 HDFG: 0	1 Aug. 1974	(5)
2717 HDFG: 3	23 Jan. 1975	(5)
2718 HDFG: Koloa even more secretive with vast reduction in water surface area from drouth...none released on island of Hawai'i this year	1 July 1974 - 30 June 1975	(41)
2719 HDFG: 0	1 Aug. 1975	(5)
2720 HDFG: 11	15 Jan. 1976	(2)
2721 HDFG: no nests or broods observed this year...no releases made...habitat in most areas continuing to deteriorate due to increased human activity	1 July 1975 - 30 June 1976	(35)
2722 HDFG: 3	4 Aug. 1976	(5)
2723 HDFG: 0	13 Jan. 1977	(5)
2724 HDFG: 0	27,28 July 1977	(2)
2725 HDFG: 0	28 Aug. 1977	(5)
2726 Shallenberger: now generally restricted to the Kohala area where they have been reintroduced	(1977)	(3)
2727 HDFG: 3	12,13 Jan. 1978	(2)
2728 HDFG: 0	28 July 1978	(5)
2729 HDFG: 0	15 Jan. 1979	(5)
2730 HDFG: 0	1 Aug. 1979	(5)
2731 HDFG: 26	14 Jan. 1980	(5)
2732 HDFG: 29	31 July, 1 Aug. 1980	(5)
2733 HDFG: 2	12-14 Jan. 1981	(5)

152

UNSPECIFIED LOCALITY

2734 started many a wild duck on return trip from Kilauea to Hilo...every hollow being under water	18 Aug. 1875	CAML76
2735 Banko: Palmer collected 4 specimens	29 Oct-12 Nov 1891	(10)
2736 Banko: Perkins collected 1 specimen at 3000 ft. el. on Mauna Loa (see No. 2927)	July 1892	(10)
2737 found...only rarely observed on some of the reservoirs	(1946-1947)	SCHC53
2738 occurs in small numbers	1972	HAWS70
2739 Shallenberger: recorded as high as 8000 ft. el....but quickly became scarce as a result of hunting pressure	(1978)	SHAR77
2739aHDFG: released 58 in the Hilo watershed near the Wailuku River	Dec. 1980	PATP81

MULTIQUADRANGLE

2740	Banko: A. Stearns, Mgr. Kohala Sugar Co., reported never seeing koloa on plantation streams or impoundments	(22 May 1968)	(18)
2741	Banko: D. Sproat, old-time ditch rider for Kohala Sugar Co., reported that there used to be a few koloa in the lower stream drainages, windward Kohala Mtns. but had not seen any for years	(22 May 1968)	(18)
2742	HDFG: ...release of captive-raised stock has achieved a measure of success...Hunters reported broods of ducklings over a wide segments of Kohala area, particularly in the mauka reservoirs	1 July 1976 - 30 June 1977	(2)

QUADRANGLE/LOCALITY

Kohala District

HAWI

Kehena Ponds/Ditch

2743	HDFG: 3 adults w/o red dye sighted	19 Feb. 1970	(42)
2744	HDFG: 2 adults + 6 young sighted...3 miles from release site	20 Mar. 1971	(42)
2745	HDFG: 6 undyed seen flying	29 July 1971	(38)
2746	HDFG: 2 undyed adults sighted	29 Oct. 1971	(38)
2747	HDFG: 12 dyed + 5 undyed adults sighted	24 Apr. 1972	(38)
2748	HDFG: 14 incl. 10 young (weak flyers) sighted	14 June 1972	(38)
2749	HDFG: 2 undyed adults sighted	14 June 1972	(38)
2750	HDFG: 1 undyed adult sighted	14 June 1972	(38)
2751	HDFG: 1 undyed flying adult sighted	14 June 1972	(38)
2752	HDFG: 3 unmarked adults sighted	18 Dec. 1972	(39)
2753	HDFG: 1 duckling caught in ditch, died	15 Jan. 1973	(39)
2754	HDFG: 13 unmarked adults observed	9 Feb. 1973	(39)
2755	HDFG: 15 unmarked adults ...3 adults suspected of nesting	15 Mar. 1973	(39)
2756	HDFG: 8 unmarked adults observed	4 June 1973	(39)
2757	HDFG: 6 1-week old ducklings seen	4 June 1973	(39)
2758	HDFG: 6 adults observed ...ponds nearly dry	Nov. 1973	(40)
2759	HDFG: 12 incl. 10 unmarked adults observed	Feb. 1974	(40)

2760 HDFG: 4 ducklings seen by Parker Ranch cowboy	Mar. 1974	(40)
2761 HDFG: 6 unmarked adults observed	Mar. 1974	(40)
2762 HDFG: 17 unmarked adults + 4 young observed	Apr. 1974	(40)
2763 HDFG: 2 flushed... very dry conditions	Spring 1976	(36)
2764 HDFG: 8 flushed from 1 pond, 1 seen in another pond + 2 seen in flight during 4th quarter...most ponds afforded good habitat	1 July 1975 - 30 June 1976	(35)
2765 HDFG: 9 flushed from 4 ponds in 3rd. quarter...pond where broods were recorded during past few years had shrunk to half its size...female seen in tall grass of this pond but thorough search failed to reveal nest or brood	1 July 1975 - 30 June 1976	(35)
2766 HDFG: pair seen on quarterly trip...very dry conditions	1 July 1975 - 30 June 1976	(36)
2767 HDFG: 11	15 Jan. 1976	(2)
2768 HDFG: 3	4,5 Aug. 1976	(2)
2769 HDFG: 6	13 Jan. 1977	(2)
2770 HDFG: 0	27,28 July 1977	(2)
2771 HDFG: 3	12,13 Jan. 1978	(2)
2772 HDFG: 0	15,16,20 Jan. 1979	(5)
2773 HDFG: 0	1,2 Aug. 1979	(5)
2774 HDFG: 20	14,15,16 Jan. 1980	(5)
2775 HDFG: 0	31 July, 1 Aug. 1980	(5)

Puu Okomau

2776 HDFG: 0	15 Jan. 1976	(2)
2777 HDFG: 0	4,5 Aug. 1976	(2)
2778 HDFG: 0	13 Jan. 1977	(2)
2779 HDFG: 0	27,28 July 1977	(2)
2780 HDFG: 0	12,13 Jan. 1978	(2)
2781 HDFG: 0	15,16,20 Jan. 1979	(5)
2782 HDFG: 0	1,2 Aug. 1979	(5)
2783 HDFG: 0	14-16 Jan. 1980	(5)

Union Mill

2784 HDFG: 0	15 Jan. 1976	(2)
2785 HDFG: 0	4,5 Aug. 1976	(2)
2786 HDFG: 0	13 Jan. 1977	(2)
2787 HDFG: 0	27,28 July 1977	(2)

2788 HDFG: 0	12,13 Jan. 1978	(2)
2789 HDFG: 0	15,16,20 Jan. 1979	(5)
2790 HDFG: 0	1,2 Aug. 1979	(5)
2791 HDFG: 0	14-16 Jan. 1980	(5)

Upolu-Biogenics Basin

2792 HDFG: 0	15 Jan. 1976	(2)
2793 HDFG: 0	4,5 Aug. 1976	(2)
2794 HDFG: 0	13 Jan. 1977	(2)
2795 HDFG: 0	27,28 July 1977	(2)
2796 HDFG: 0	12,13 Jan. 1978	(2)
2797 HDFG: 0	15,16,20 Jan. 1979	(5)
2798 HDFG: 0	1,2 Aug. 1979	(5)
2799 HDFG: 0	14-16 Jan. 1980	(5)

HONOKANE

Pololu Valley

2800 Shallenberger: Lum stated that he frequently observed color marked koloa until approximately two years ago... no explanation for the decrease in visits by koloa as the use of his land had not changed appreciably	(1977)	(3)
2801 Giffin: seen regularly	(1981)	PATP81

KAWAIHAE

Kahua Ranch Ponds/Release Site

2802 21 captive-raised koloa transported to Kahua Ranch	30 Nov. 1958	SWEG69
2803 HDFG: 21 captive-raised koloa released into wild	12 Dec. 1958	PATP81
2804 HDFG: 4 sighted...remnants of recent release of 21	7-16 Jan. 1959	(1)
2805 Walls: reported 1 brood of 1, 1 brood of 2	12 July 1959	SWEG69
2806 HDFG: released 4 captive-raised koloa...5 (1958 & 1959) released stock seen	1 Aug. 1959	SWEG69
2807 HDFG: 1	4-8 Jan. 1960	(1)
2808 none seen or reported by residents	6 July 1960	SWEG69
2809 Banko: saw 2, possibly 3, smallish ducks judged to be koloa on unnamed reservoir ca. 3900 ft. el. south of Puu Pili	20 May 1968	(18)

2810	Banko: flushed 2 in same reservoir as previous day... confirmed impression of koloa...double white wingbars, gadwall sized, nondeterminate grayish color	21 May 1968	(18)
2811	Banko: M. Richards and A. Wall reported seeing a few ducks in the summer months since liberation by D. Woodside in 1958 and 1959...mostly on ponds south of Puu Pili	(21 May 1968)	(18)
2812	two observed...first sighting of wild koloa on Hawai'i in more than 20 years...(result of stock released 1958-59?)/ in a small pool of Waikoloa stream approximately 400 yards above the Marine Dam...Kohala watershed	30 Oct. 1968	SWEG69
2813	HDFG: released 30 drakes + 22 ducks banded and dyed red at Pohakuloa	6 Dec. 1968	(42)
2814	USFWS: 52 released ...most had flown out of release pen within 2 weeks...one found dead on the new Mahukona-Kawaihae Highway	(6 Dec. 1968)	(12)
2815	USFWS: nearly all Dec. 1968 captive-raised released stock dispersed...no sightings have been reported by anyone	Jan. 1969	(12)
2816	HDFG: 23 drakes + 21 ducks, banded and dyed red at Pohakuloa, were released	12 Nov. 1969	(42)
2817	HDFG: 2 red-dyed adults sighted	19 Feb. 1970	(42)
2818	HDFG: 2 red-dyed adults sighted	12 Mar. 1970	(42)
2819	HDFG: 19 drakes + 23 ducks, banded and dyed at Pohakuloa, were released	6 Nov. 1970	(42)
2820	HDFG: 2 adults + 8 young sighted 1 mile from release site	16 Apr. 1971	(42)
2821	HDFG: 2 undyed adults sighted	31 Aug. 1971	(38)
2822	HDFG: 2 undyed adults sighted	28 Sep. 1971	(38)
2823	HDFG: 30 drakes + 23 ducks, banded and dyed red at Pohakuloa, were released	29 Dec. 1971	(38)
2824	unverified reports of 3 broods reared in the wild	1971	HAWS70
2825	HDFG: 8 dyed adults sighted	14 June 1972	(38)
2826	HDFG: 55 released	14 Nov. 1972	(1)
2827	HDFG: 15 marked adults observed	18 Dec. 1972	(39)
2828	received reports of several broods reared in the wild near the point of release	1972	HAWS70
2829	HDFG: 4 faintly-marked adults observed	9 Feb. 1973	(39)
2830	HDFG: 10 incl. 5 dyed observed	15 Mar. 1973	(39)
2831	HDFG: 1 numarked adult observed	4 June 1973	(39)
2832	HDFG: 1 unmarked adult observed	Sep. 1973	(40)
2833	HDFG: 29 drakes + 26 ducks (pen-raised, banded and dyed yellow at Pohakuloa) released	14 Nov. 1973	(39)

2834	HDFG: released 55 captive-raised individuals	18 Nov. 1973	PATP81
2835	HDFG: 4 unmarked adults observed	Nov. 1973	(40)
2836	HDFG: 28 drakes + 19 ducks (pen-raised, dyed red and banded at Pohakuloa) were released...remains of 1 found dead	14 Jan. 1974	(40)
2837	HDFG: 47 released	14 Jan. 1974	(1)
2837a	44 (?47) 28 drakes, 19 hens released	14 Jan. 1974	PATP81
2837b	52 produced at Pohakuloa...48 released in Kohala...a small nucleus maintaining itself at the Kohala release site	(?1974)	HAWS75
2838	HDFG: 6 adults + 8 adults from 14 Jan. 1974 release observed	Feb. 1974	(40)
2839	HDFG: adults flushed on 3 occasions at Kohua release pond and a Kehena reservoir...no young seen	1 July 1974 - 30 June 1975	(41)
2840	HDFG: evaluation of koloa releases...total of 159 drakes and 134 ducks at Kahua Ranch from 1971 through 1974...shows that survival, based on observations of unmarked birds, appears to have been good...natural reproduction was observed during each year from 1971 through 1974...dispersal has been restricted...from sanctuaries not imperative at this time, since range is relatively secure...an alternate release site in Waipio Valley should be developed to accelerate dispersal to other suitable habitats...all data were evaluated to provide information for the development of a management plan, including establishment of sanctuaries and alternative release sites	20 Apr.-18 Oct. 1975	(37)
2841	HDFG: 2 flushed...very dry conditions...release site reduced to 4 wet areas	Spring 1976	(36)
2842	HDFG: 4 flushed...very dry conditions	Fall 1972	(36)
2843	HDFG: 25 drakes + 18 ducks placed in release pens...some escaping into the reservoir a few days later, remainder flying out approximately 2 months later	25 Oct. 1979	(33)
2844	HDFG: 6 sighted at release site and 20 censused at 3 other ponds	15 Jan. 1980	(33)
2845	HDFG: 6	14,15,16 Jan. 1980	(5)
2846	HDFG: 0	31 July, 1 Aug. 1980	(5)
2847	Giffin: seen regularly	(1981)	PATP81

KAMUELA

Hamakua Ditch

2848 pair can often be found feeding	(1973)	VANC73
2849 duck with 5 ducklings seen by Hawaii State Department of Water and Land Development employees		

Waimea (Area)

2850 Giffin: seen regularly	(1981)	PATP81
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KUKUIHAELE

Kukuihaele

2851 HDFG: 0	15 Jan. 1976	(2)
2852 HDFG: 0	4,5 Aug. 1976	(2)
2853 HDFG: 0	13 Jan. 1977	(2)
2854 HDFG: 0	27,28 July 1977	(2)
2855 HDFG: 0	12,13 Jan. 1978	(2)
2856 HDFG: 0	15,16,20 Jan. 1979	(5)
2857 HDFG: 0	1,2 Aug. 1979	(5)
2858 HDFG: 0	14-16 Jan. 1980	(5)
2859 HDFG: 0	31 July, 1 Aug. 1980	(5)

Lalakea

2860 HDFG: 0	15 Jan. 1976	(2)
2861 HDFG: 0	4,5 Aug. 1976	(2)
2862 HDFG: 0	13 Jan. 1977	(2)
2863 HDFG: 0	27,28 July 1977	(2)
2864 HDFG: 0	12,13 Jan. 1978	(2)
2865 HDFG: 0	15,16,20 Jan. 1979	(5)
2866 HDFG: 0	1,2 Aug. 1979	(5)
2867 HDFG: 0	14-16 Jan. 1980	(5)

Waipio Valley

2868 Matsunami: abundant...when rice growing was popular	(1919)	(18)
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2869 Matsunami; disappeared...after last rice was grown	(1927)	(18)
2870 HDFG: 0	15 Jan. 1976	(2)
2871 HDFG: 0	4,5 Aug. 1976	(2)
2872 HDFG: 0	13 Jan. 1977	(2)
2873 HDFG: 0	27,28 July 1977	(2)
2874 Shallenberger: One landowner that appeared quite familiar with waterbirds indicated that he had observed a flock of 10-12 koloa in the north pond two years prior to our 1977 survey	(1975)	(3)
2875 HDFG: 0	12,13 Jan. 1978	(2)
2876 HDFG: 0	15,16,20 Jan. 1979	(5)
2877 HDFG: 0	14-16 Jan. 1980	(5)
2878 HDFG: 0	12 Jan. 1981	(5)
2879 Giffin: seen regularly	(1981)	PATP81

Kona District

PUU HINAI

Francis Brown (Waipuhi, Manoku, Hopeaia Fishponds)

2880 HDFG: 0	15 Jan. 1976	(2)
2881 HDFG: 0	4,5 Aug. 1976	(2)
2882 HDFG: 0	13 Jan. 1977	(2)
2883 HDFG: 0	27,28 July 1977	(2)
2884 HDFG: 0	12,13 Jan. 1978	(2)
2885 HDFG: 0	15,16,20 Jan. 1979	(5)
2886 HDFG: 0	1,2 Aug. 1979	(5)
2887 HDFG: 0	14-16 Jan. 1980	(5)

MAKALAWENA

Opaeula (Makalawena) Pond

2888 observed what apparently were two koloa	3 May 1968	SWEG69
2889 HDFG: 0	15 Jan. 1976	(2)
2890 HDFG: 0	4,5 Aug. 1976	(2)
2891 HDFG: 0	13 Jan. 1977	(2)
2892 Shallenberger: one seen on first trip but none on second ...presumably koloa which visit this pond are birds (or	9 June, 8 July 1977	(3)

their offspring) that have been released in recent years
in the Kohala Mountains

2893 HDFG: 0	27,28 July 1977	(2)
2894 HDFG: 0	12,13 Jan. 1978	(2)
2895 HDFG: 0	27,28,30 July 1978	(5)
2896 HDFG: 0	15,16,20 Jan. 1979	(5)
2897 HDFG: 0	1,2 Aug. 1979	(5)
2898 HDFG: 0	14-16 Jan. 1980	(5)

KEAHOLE POINT

Aimakapa (Honokohau) Fishpond

2899 HDFG: 0	15 Jan. 1976	(2)
2900 HDFG: 0	4,5 Aug. 1976	(2)
2901 HDFG: 0	13 Jan. 1977	(2)
2902 HDFG: 0	27,28 July 1977	(2)
2903 HDFG: 0	12,13 Jan. 1978	(2)
2904 HDFG: 0	27,28,30 July 1978	(5)
2905 HDFG: 0	15,16,20 Jan. 1979	(5)
2906 HDFG: 0	1,2 Aug. 1979	(5)
2907 HDFG: 0	14-16 Jan. 1980	(5)

Kaloko Fishpond

2908 HDFG: 0	15 Jan. 1976	(2)
2909 HDFG: 0	4,5 Aug. 1976	(2)
2910 HDFG: 0	13 Jan. 1977	(2)
2911 HDFG: 0	27,28 July 1977	(2)
2912 HDFG: 0	12,13 Jan. 1978	(2)
2913 HDFG: 0	15,16,20 Jan. 1979	(5)
2914 HDFG: 0	1,2 Aug. 1979	(5)
2915 HDFG: 0	14-16 Jan. 1980	(5)
2916 HDFG: 0	31 July, 1 Aug. 1980	(5)
2917 HDFG: 0	12 Jan. 1981	(5)

HUALALAI

Huehue Mauka Ponds

2918 HDFG: 0
2919 HDFG: 0
2920 HDFG: 0
2921 HDFG: 0
2922 HDFG: 0
2923 HDFG: 0
2924 HDFG: 0

15 Jan. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

HONAUNAU

Captain Cook (Kaawaloa)

2925 Perkins: shot 1...vicinity Kaawaloa

26 July (1892) (15)

Kau District

KA LAE

Kaalualu

2926 pair shot
2927 HDFG: 0
2928 HDFG: 0
2929 HDFG: 0
2930 HDFG: 0
2931 HDFG: 0
2932 HDFG: 0
2933 HDFG: 0
2934 HDFG: 0
2935 HDFG: 0

Oct. 1899 HENH02
15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

NAALEHU

Honuapo

2936 HDFG: 0

13 Jan. 1977 (2)

2937 HDFG: 0
2938 HDFG: 0
2939 HDFG: 0
2940 HDFG: 0
2941 HDFG: 0
2942 HDFG: 0

27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)
12 Jan. 1981 (5)

Waiohinu

2943 Christ: found in small numbers

(1941)

BALP41

PUNALUU

Punaluu

2944 HDFG: 0
2945 HDFG: 0
2946 HDFG: 0
2947 HDFG: 0
2948 HDFG: 0
2949 HDFG: 0
2950 HDFG: 0

15 Jan. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)

Kilauea District

KEAAU RANCH

Keaau

2951 HDFG: 0
2952 HDFG: 0
2953 HDFG: 0
2954 HDFG: 0
2955 HDFG: 0
2956 HDFG: 0
2957 HDFG: 0

15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
27,28,30 July 1978 (5)
15,16,20 Jan. 1979 (5)

Mauna Kea District

AHUMOA

Pohakuloa

- | | | | |
|------|--|-----------|------|
| 2958 | HDFG: one of the (Dec. 1968, Kahua Ranch) released birds
seen daily during the month | Jan. 1969 | (12) |
| 2959 | HDFG: one of the (Dec. 1968, Kahua Ranch) released birds
flew back...second one to return | Feb. 1969 | (12) |

PUU OO

Puu Oo

- | | | | |
|------|--|--------------|--------|
| 2960 | observed quantity of these birds in shallow pools called
the duck ponds at open space in the woods, Mauna Kea, on
way to the summit | 11 Jan. 1841 | WILC45 |
| 2961 | observed 3 land, remain from 0900 to 0915, and leave to
the north, both unbanded; on small pond on Puu Oo Ranch,
4 km. north of mile marker 23 on the Saddle Road, 1800 m.
elevation, on southeast flank of Mauna Kea | Oct. 1980 | PATP81 |

HILO

Hilo (Area)

- | | | | |
|------|---|-----------------|--------|
| 2962 | 2 specimens obtained within 8 miles of Hilo | Aug. 1875 | SCLP81 |
| 2963 | Banko: Challenger Expedition members collected 1 specimen | 14-19 Aug. 1875 | (10) |
| 2964 | observed | (1893) | WILS93 |
| 2965 | by no means uncommon | ca. 1897 | HENH02 |
| 2966 | becoming comparatively scarce | (1902) | HENH02 |

Ahn (Kionakapahu Pond)

- | | | | |
|------|---------|--------------------|-----|
| 2967 | HDFG: 0 | 15 Jan. 1976 | (2) |
| 2968 | HDFG: 0 | 4,5 Aug. 1976 | (2) |
| 2969 | HDFG: 0 | 13 Jan. 1977 | (2) |
| 2970 | HDFG: 0 | 27,28 July 1977 | (2) |
| 2971 | HDFG: 0 | 12,13 Jan. 1978 | (2) |
| 2972 | HDFG: 0 | 27,28,30 July 1978 | (5) |

2973 HDFG: 0	15,16,20 Jan. 1979	(5)
2974 HDFG: 0	1,2 Aug. 1979	(5)
2975 HDFG: 0	14-16 Jan. 1980	(5)

Nakagawa (Lokoaka) Pond

2976 HDFG: 0	15 Jan. 1976	(2)
2977 HDFG: 0	4,5 Aug. 1976	(2)
2978 HDFG: 0	13 Jan. 1977	(2)
2979 HDFG: 0	27,28 July 1977	(2)
2980 HDFG: 0	12,13 Jan. 1978	(2)
2981 HDFG: 0	27,28,30 July 1978	(5)
2982 HDFG: 0	15,16,20 Jan. 1979	(5)
2983 HDFG: 0	1,2 Aug. 1979	(5)
2984 HDFG: 0	14-16 Jan. 1980	(5)

Wailoa (Waiakea) Pond

2985 Shallenberger: according to H. Baldwin some were released (1977)		(3)
in "Wailoa Pond" prior to 1960 but all were killed directly		
or indirectly by the 23 May 1960 tsunami		
2986 HDFG: 0	15 Jan. 1976	(2)
2987 HDFG: 0	4,5 Aug. 1976	(2)
2988 HDFG: 0	13 Jan. 1977	(2)
2989 HDFG: 0	27,28 July 1977	(2)
2990 HDFG: 0	12,13 Jan. 1978	(2)
2991 HDFG: 0	27,28,30 July 1978	(5)
2992 HDFG: 0	15,16,20 Jan. 1979	(5)
2993 HDFG: 0	1,2 Aug. 1979	(5)
2994 HDFG: 0	14,15,16 Jan. 1980	(5)

HONOKAA

Honokaa Mill

2995 HDFG: 0	4,5 Aug. 1976	(2)
2996 HDFG: 0	27,28 July 1977	(2)

Kukaiau

2997 HDFG: 0
2998 HDFG: 0
2999 HDFG: 0
3000 HDFG: 0
3001 HDFG: 0
3002 HDFG: 0
3003 HDFG: 0
3004 HDFG: 0

15 Jan. 1976 (2)
4,5 Aug. 1976 (2)
13 Jan. 1977 (2)
27,28 July 1977 (2)
12,13 Jan. 1978 (2)
15,16,20 Jan. 1979 (5)
1,2 Aug. 1979 (5)
14-16 Jan. 1980 (5)